Biyani's Think Tank

Concept based notes

Micro Economics Theory

Economics [Paper-I]
B.A. [Part-I]

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Preface

I am glad to present this book, especially designed to serve the needs of the students. The book has been written keeping in mind the general weakness in understanding the fundamental concept of the topic. The book is self-explanatory and adopts the "Teach Yourself" style. It is based on question-answer pattern. The language of book is quite easy and understandable based on scientific approach.

Any further improvement in the contents of the book by making corrections, omission and inclusion is keen to be achieved based on suggestions from the reader for which the author shall be obliged.

I acknowledge special thanks to Mr. Rajeev Biyani, *Chairman* & Dr. Sanjay Biyani, *Director (Acad.)* Biyani Group of Colleges, who is the backbone and main concept provider and also have been constant source of motivation throughout this endeavour. We also extend our thanks to Biyani Sikhshan Samiti, who played an active role in co-ordinating the various stages of this endeavour and spearheaded the publishing work.

I look forward to receiving valuable suggestions from professors of various educational institutions, other faculty members and the students for improvement of the quality of the book. The reader may feel free to send in their comments and suggestions to the under mentioned address.

Author

Economics

Scheme:

	Min pass marks	Max. Marks	
Arts	72	200	
Science	54	150	
Paper-I	3hrs. duration	Arts:100	Science: 75
Paper–II	3 Hrs. duration	Arts:100	Science:75

Note:

1. There will be two papers of Economics. Each paper will have 3 questions from each section. In addition to these nine questions (3 questions from each section) there shall be one multiple choice/objective type question in each of the two papers. This question shall be compulsory.

2. The candidate will be required to attempt five questions on all in each paper selecting at least one question from each section and one compulsory multiple choice/ objective type question. Each equation will carry 20 Marks.

3. The multiple choice/objective type question will consist of 20 question of one mark each. Paper- I Micro Economic Theory

Section –A

Economic Theory: Nature and technique. Micro and macroeconomics. Static dynamic and comparative static analysis. Positive and normative economics. Theory of consumer‟s behavior: Utility analysis. Indifference curve analysis, Consumer‟s equilibrium, Price substitution and Income effect. Normal inferior and gutter goods. Price consumption curve and derivation of demand curve. Elasticity of demand: Price income and cross elasticity of demand. Arc and point elasticity. Relationship between elasticity. AR, MR and TR. Factors affecting price elasticity of demand. Substitute and complementary goods, concept of consumer‟s surplus.

Section – B

Production Function : Law of variable proportions. Three stages of production Iso quant and iso - cost, optimum factor combination. Law of returns and returns to scale. Theory of cost - short run and long run cost curves. Different market structures: Perfect competition:

determination or price and long run. Discriminating monopoly. Monopolistic competition short and long run equilibrium of the firm. Excess capacity.

Section –C

Marginal productivity theory of distribution factor pricing under perfect and imperfect competition in labour market. Ricardina theory of rent. Modern theory of rent and quasi - rent Classical theory of interest, liquidity preference theory of interest. Risk and uncertainty theory of profit.

Books Recommended:

1. D. Salvator: Micro Economic, harper- Collins, 1991
2. H.L. Ahuja: Advanced Economic Theory, S. Chand and Company, New Delhi.
3. H.L. Ahuja: Uchchatar Arthik Siddhant, S.Chand & Co., New Delhi
4. Laxminarayan Nathuramka : Vyasti Arthshastra, College Book House, Jaipur.

Reference Books:

1. R.H. Left witch : price System and Resource Allocation (Hindi & English)
2. Samuelson and Nordhans: Economics
3. J.P. Gould and C.E. Ferguson : Micro Economic theory Revised by J.P. Gould and e. P. Lazer, All India Traveler Book Seller. Delhi.

Contents

CHAPTER-I

Micro Economy

Objective Type Question

Q.1. Economics is
(a) The study of the markets for stocks and bonds
(b) The study of choice under conditions of scarcity
(c) Exclusively the study of business firms
(d) Fundamentally the same as sociology
Correct Answer (b)

Q.2. The terms Micro economics and macro economics were coined by:-
(a) Ragner Frisch (b) Lord Keynes
(c) J.R. Hicks (d) Marshall
Correct Answer (a)

Q.3. Price There is also called by another name.
(a) Macroeconomics (b) Price control
(c) Public Finance (d) Micro economic
Correct Answer (d)

Q.4. In a free enterprise economy the problems of what, how and for whom are solved by.
(a) A planning committee (b) The elected representatives of two people
(c) The price mechanism (d) None of the above
Correct Answer (c)

Q.5. We consume more of a commodity its total utility.
(a) Increase at a diminishing rate (b) Decrease at a diminishing rate
(c) Remains the same (d) Falls to zero
Correct Answer (a)

Q.6. The marginal utility of a particular commodity at the point of saturation is–
(a) Zero (b) Unity

(c) Negative (d) Positive
Correct Answer (a)

Q.7. When demand curve is vertical it represents
(a) Unitary elastic demand (b) Perfectly elastic demand
(c) Perfectly inelastic demand (d) Relatively elastic demand
Correct Answer (c)

Q.8. Utility analysis is called by other name.
(a) Cardinal approach (b) Ordinal approach
(c) Price theory (d) None
Correct Answer (a)

Q.9. The three groups of decision makers in the economy are
a. households, business firms, and banks
b. households, business firms, and governments
c. business firms, governments, and banks
d. business firms, banks, and foreign traders
Correct Answer (b)

Q.9. The three groups of decision makers in the economy are
(a) Households, business firms, and banks
(b) Households, business firms, and governments
(c) Business firms, governments, and banks
(d) Business firms, banks, and foreign traders
Correct Answer (b)

Q.10. "Senior citizens deserve an income that will allow them to live in comfort for their remaining years." This is
(a) Neither a normative nor a positive statement
(b) Both a positive and a normative statement
(c) A positive statement
(d) A normative statement
Correct Answer (d)

Long Answer type Question

Q.1. Define micro & macro Economics.

Ans. Micro Economics word is derived from Greek word Mikros, which means small. Macro Economics is derived from Greek word Makros which means large. Microeconomic the only studies the economic behavior of individual decision making unit such as individual consumers, resource owners and business firms and the operation of individual markets in a free enterprise economy. This is to be contrasted with macroeconomic theory, which studies (a) the total or aggregate level of output and national income and (b) the level of national employment, consumption, investment and prices for the economy viewed as a whole both micro economics and macro economics provide very useful tools of analysis and both are important while macro economics often makes the headlines, microeconomics attempts to explain some of the most important economic and social problems of the day. These range from the high cost of energy to welfare programs, environment pollution, rent, control, minimum wages, safety regulations, rising medical costs, monopoly, discrimination, labour unions, wages and leisure, crime and punishment, taxation and subsidies and so on. Microeconomics focuses attention on two broad categories of economic units: households and business firms, and it examines the operation of two types of markets, the market for goods & services and the market for economic recourse. The interaction of households and business firms in the markets for goods & services and in the markets for economic resources represents the core of the free enterprise economic system. Specifically households own the labor, the capital, the land and the natural resources that business firms require to produce the goods and service households want business firms pay to households, wages, salaries, interest, rents and so on, for the services and resources that households provide. Household then use the income that they receive from business firms to purchase the goods and services produced by business firms. The income of households are the production costs of business firms. The expenditure of households are the receipts of business firms The so called circular flow of economic activity is complete.

The circular flow of economic activity can be visualized in fig.1 1

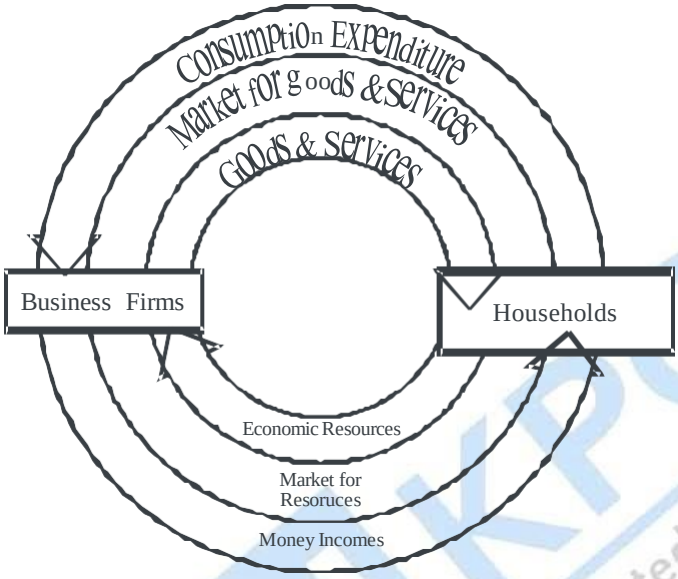


Fig 1.1 :- The circular flow of Economic Activity

The inner loop shows the flow of resources from households to business firms and shows the flow of goods and services from business firms to household. The outer loop shows the flow of money incomes from business firms to households and shows the flow of consumption expenditure from households to business firms. The prices of goods & services are determined in the top half of the figure, and the prices of resources are determined in the bottom half of the figure.

Q.2 Differentiate between positive and normative Analysis?

Ans. Positive analysis studies what is? It is concerned with how the economic system performs the basic functions of what to produce, how to produce, for whom to produce, how it provides for growth and how it rations the available supply of a good over time. In other words, how is the price of a commodity, service or resource actually determined in the market? How do producers combine resource to minimize cost of production? How do the no. of firms in a market and the type of product they produce affect the determination of the price and quantity sold of the commodity? How do the number and type of owners and users of a resource affect the price and quantity sold of the commodity? How do the number and type of owners and users of a resource affect the price and quantity of the resource placed on the market? How do specific taxes and subsidies affect the production and consumption of various commodities and use of various resources? what are two

effects of minimum wages on employment and income? The level of real wages on work and leisure? Rent control on the availability of housing? Deregulation of gas on gas price and consumption? How does the economic system provide for the growth of the nation? All of these and many more topics fall within the area of positive analysis for the most part, positive analysis is factual or hypothetically testable and objective in nature and it is devoid of ethical or value judgments.

Normative analysis on the other hand studies what ought to be. It is concerned with how the basic economic function should be performed. Normative analysis is thus based on value judgment and as such is subjective and controversial where as positive analysis is independent of normative analysis, normative analysis is based on positive analysis and the value judgment of society. Controversies in positive analysis can be (and are) usually resolved by the collection of more or better market data. On the other hand, controversies in normative analysis usually are not and cannot be resolved.

Q.3. Define utility or cardinal Approach.

Ans. <u>Introduction</u>

Demand analysis studies the behavior of individual consumers. Adam smith in his famous book "Wealth of Nations" 1776 used the concepts of value in use and value in exchange. He pointed out that value in exchange is actual price which a consumer pays for a commodity and value in use is the actual satisfaction a consumer derived from its consumption. The theory of consumer further developed by the contribution of Prof. Williom Stanley, Walrus and Carl manger who are known as utilitarian. The credit goes to professor Alfred Marshall who contributed to the theory of consumer behavior the latest developments which were included in his book principles of Economics in 1890. Prot. Marshall and his contemporary economists are known as neo-classical economists.

There are several determinants for the demand of a commodity namely price of commodity, income, price of related goods, habit, volume of credit, fashion, advertisement and sales promotion, population, credit policy. It is not easy to include all these determinants in the demand analysis. However, some major elements can be studied namely price of a commodity, income, price of related goods, advertisements etc. law of diminishing marginal utility is the oldest law of demand. Professor Marshall has contributed to the marginal utility approach and several laws of economics have been proposed on the basis of the analysis. They are:-

(1) Law of diminishing marginal utility.

(2) Law of equi marginal utility

(3) Consumer"s surplus.

(4) Law of demand.

Meaning & Definition of utility

Utility is defined as the want satisfying power of a commodity or service. The utility from a commodity differs from one person to another. It means it is subjective by nature. Prof Alfred Marshall:- "The utility of a thing to a person at a time is measured by the extent to which it satisfies his wants".

Salient feature of utility

(1) Not related with usefulness or welfare.

(2) Utility is measurable.

(3) Utility is a relative term and absolute. And based on its relative importance affected by the want satisfying power.

(4) Utility is subjective:- Utility of a commodity is determined by several factors such as mentality, tastes of a consumer, economic, social and religious environment etc.

(5) Utility depends on the intensity of want.

(6) Utility is concerned with consumer goods only.

(7) Utility does not mean actual consumption.

(8) Utility has no physical shape. It depends on the mental state of a consumer.

(9) Marginal utility of money remains constant.

(10) Rationality of the consumer.

Measurement of Utility Two approaches to utility analysis:

(1) Cardinal approach to utility.

(2) Ordinal approach to utility.

Marshall and other neo-classical economists have developed & advocated this approach to utility. Money is the measuring rod of utility. The method of measuring utility in terms of numbers is called cardinal approach. We can measure the utility in terms of money. Utility can be added, subtracted and multiplied with the help of this method in cardinal nos. like 1,2,3,4 & so on.

Ordinal Approach to Utility

According to ordinal economists like J.R. Hicks, R.G.D. Allen, F.Y. Edgeworth and Vilfredopareto. Utility is not cardinally measurable and it can be measured in ordinal

numbers like I,II,III and so on. These economists put forward the following arguments against the cardinal measurement of utility.

(i) Utility is a psychological & subjective concept which cannot be measured.

(ii) The mental state and attitude of each individual go under change frequently. Hence, Utility is not measurable and pointed by modern economists.

(iii) The measuring rod of utility, as put forward by Prof. Alfred Marshall is money which is not a stable and exact measurement as we find in case of natural & physical sciences.

Q.4. Define kinds of utility & their relationship

Ans. Kinds of Utility

(1) Total utility (TU)

(2) Marginal Utility (MU)

(3) Average Utility (AU)

TU =Utility derived from the consumption of all units of a commodity MU = The addition to TU by consuming an additional unit of a commodity by the consumer.

$MU_x = \frac{\Delta TU_x}{\Delta Q_x}$ Where, MU_x = marginal utility of x commodity "ΔTU_X is the change in total utility of commodity x, ΔQ_x = change in consumption of commodity x

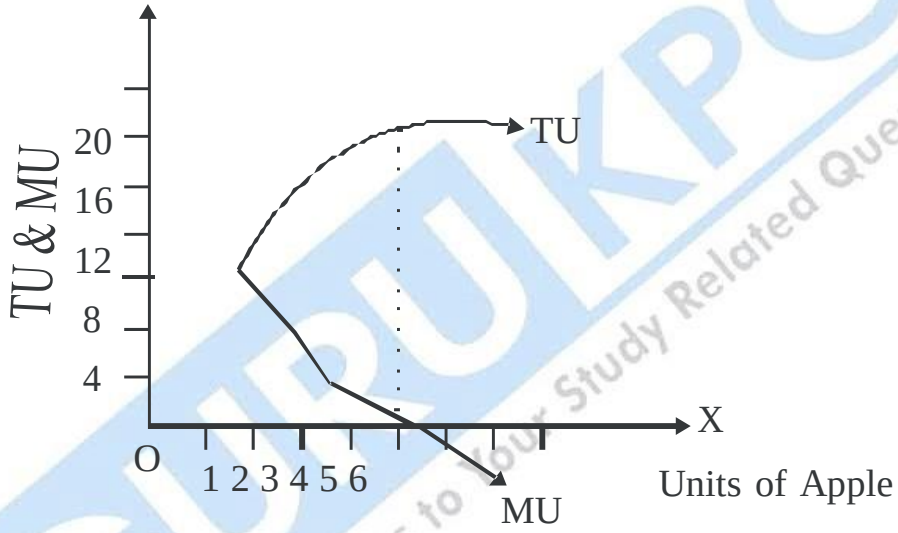
Average Utility (AU) = Utility derived by dividing the number of units of a commodity to the total utility derived by the consumer. Or AU= TU/ No. of units

Relationship Between TU & MU

There is a close relationship between TU& MU. Because the summation of MUs is the total utility derived from various units of a commodity. MUs=TU

Table -1 (TU & MU)

Units of Apple	TU	MU
1	8	-
2	14	6 Positive but decreasing
3	18	4 " "
4	20	2 " "
5	20	0 → Zero –Saturation point
6	18	-2 → Negative



Q.5. Define law of diminishing Marginal utility.

Ans. **Consumers Behavior with single commodity**

Human wants are unlimited, Resources are limited and they have alternative uses. A particular want can be satisfied with a point of time and all the wants cannot be satisfied at all.

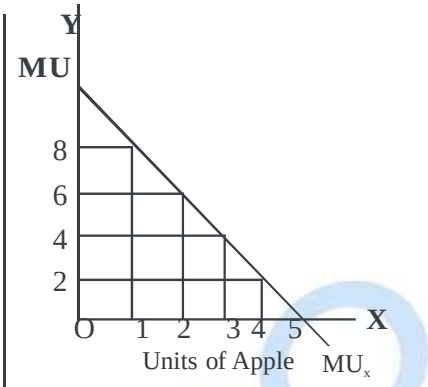
Definition & Explanation of the law

Marshall:- The additional benefit which a person derives from a given increase if a stock of a thing diminishing, other thing being equal, with every increase in the stock that we already has.

Explanation of the law

Explanation of the law

Units of Apple	MU
1	8
2	6
3	4
4	2
5	0
6	-2



Causes of operating the law

1. Satiety of a want
2. Intensity of want declines
3. No perfect substitutes of goods
4. Nature of human behavior
5. Variety of uses

Assumptions of the law:-

1. All the units of the commodity should be homogeneous
2. Adequate & suitable Quantity of consumption
3. Continuity in consumption
4. No change in the mental state of consumer.
5. Income, habit, taste and preference of the consumer do not change
6. Price of the commodity and its related goods remains constant
7. want should be a single one and not multiple want
8. Applies to pleasure Economy only
9. Marginal utility of money remains constant

Exceptions to the law

(1) Consumption of very small units of the commodity
(2) Rare commodities, monuments and antiques
(3) Classical music, gazals, Poems etc.
(4) Complementary goods.
(5) Miser men
(6) Alcoholic Drinks
(7) Increase in the no. of users or consumers

(8) Personal Hobbies

Importance of the law

A. Theoretical Importance

(i) Law of demand
(ii) Law of equimarginal utility
(iii) Consumer"s surplus
(iv) Theory of pricing

B. Practical Importance

(i) Basis of production
(ii) Importance in public finance
(iii) Basis of socialist system of wealth distribution
(iv) Value in use and value in exchange is explained

Criticisms of the law

(1) Utility is not measurable
(ii) Marginal utility of money does not remain constant
(iii) Based on subjectivity
(iv) Ignores macro analysis
(v) Ignores other effects

Q.6. Explain the law of equi-marginal utility.

Ans. The law of equi-marginal utility is based on the law of diminishing marginal utility. This law operate when different units of different commodities are consumed and consumer tries to maximize his satisfaction with his given resources. The law is called the law of substitution. The consumer should allocate his resources on different units of different commodities that in the last the MU of each commodity is equalized.

Prof. Marshall:- "If a person has thing which can be put to several uses, he will distribute it among these uses in such a way that it has the same MU in all. If it had a greater MU in one use than another he would gain by taking some of it from second use and applying it to the first".

Explanation of the law:-Consumer arranges his wants in order of intensity and the order of satisfaction is arranged on the basis of intensity of these wants and goes in satisfying his wants till the MU of all the goods equalized in proportion to money spent on them in this manner be can maximizes his satisfaction.

Table

Total Utility & Marginal Utility

Units Commodities	MU of Commodity (MU_x)	Marginal Utility (M uy)
1	20	24
2	18	21
3	16	18
4	14	15
5	12	12
6	10	9

Total Money = 24 Rs.
P*x* = 2 Rs.
Py = 3 Rs.

Units	MU/P_x	MU_y/P_y
1	10	8
2	9	7
3	8	6
4	7	⑤
5	6	4
6	⑤	3

Consumer"s Maximum Satisfaction

$$\frac{MUx}{Px} = \frac{MU_y}{P_y} = MU_m$$

$(P_x \times 6) + (Py \times 4)$
$24 = (2 \times 6) + (3 \times 4) = (12+12)$

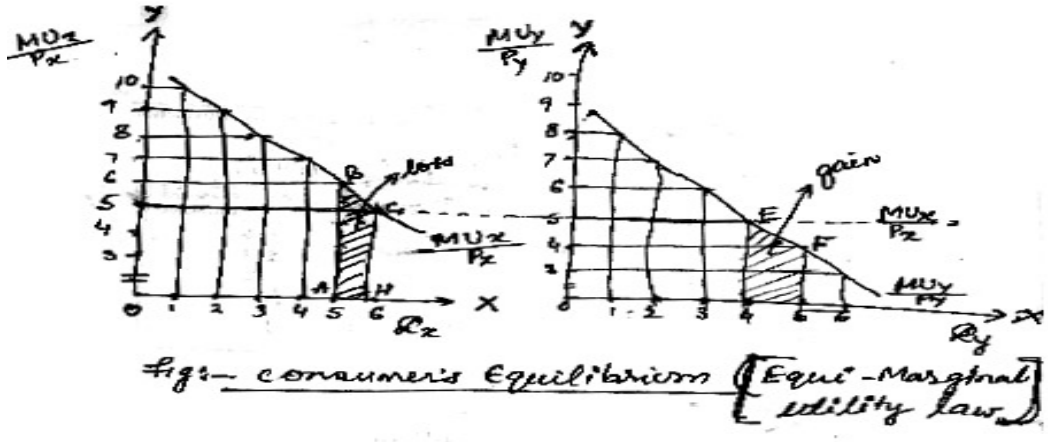


Fig:- consumer's Equilibrium [Equi-Marginal utility law]

Assumptions of the law.

(1) Rationality of the consumers

(2) Utility is Measurable

(3) Constant Marginal utility of Money

(4) Operation of the law of diminishing MU

(5) Taste, preference, fashion & income of consumer do not change

(6) No change in the prices of related goods

(7) Divisibility of goods

(8) The period of income & expenditure of the consumer is the same.

Multiple commodities Equilibrium condition

$$\frac{Mu_a}{P_a} + \frac{Mu_b}{P_b} + \frac{Mu_c}{P_c} \ldots\ldots\ldots\ldots \frac{Mu_n}{P_n} = I \ldots\ldots (i)$$

$$Q_a.P_a + Q_b.P_b + \ldots\ldots\ldots\ldots Q_n P_n = Y \ldots\ldots\ldots\ldots\ldots (ii)$$

In the above equation MUa, MUb, MUc, and so on are the marginal utilities of a, b and c commodities MU_n is MU of N^{th} commodity, Pa, Pb, and Pc are prices of a, b, c commodities. P*n* is the quantities consumed of a, b, c commodities Qn is quantity of the n^{th} commodity.

Y= money income of the consumer.

Scope & Importance of the law

It applies to all economic areas

(1) Theory of consumer Behavior

$$\frac{MU_a}{MU_b} = \frac{P_a}{P_b} \ldots\ldots\ldots (1)$$

$$Q_a P_a + Q_b P_b = y(money income) - - - (2)$$

(2) Theory of Production

Producers equilibrium =

$$\frac{MPP_L}{MPP_K} = \frac{P_L}{P_K}$$

$$or \frac{MPP_L}{P_L} = \frac{MPP_K}{P_K}$$

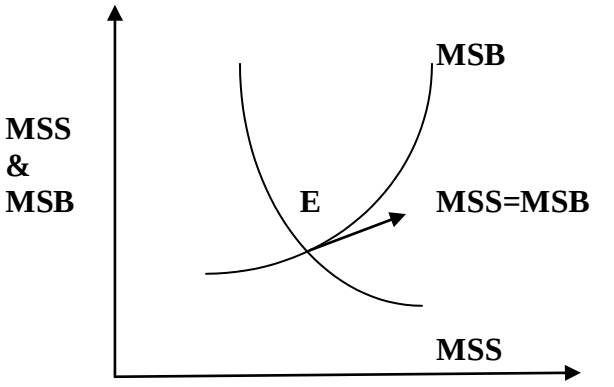
(3) Theory of exchange:-

$$\frac{MUa}{Mu_b} (\ for\ Ram) = \frac{MUb}{MUa} (\ for\ shyam)$$

This clearly shows that both Ram & Shyam well stop their exchange as they have attained the objective of equalizing the marginal gain in the process of exchange.

(4) <u>Theory of distribution</u>:- According to marginal productivity theory of distribution, each factor & production will get the share on the basis of its marginal productivity from the NI pool W<MPP_L=workers are exploited when W>MPP_L= firm is incuring loss. So the wages should be equal to MPP_L.

(5) Theory of Public Finance:-



Limitations of law

1. Indivisibility of goods
2. Budget period is not definite
3. Change in the prices of related goods
4. Non availability of goods
5. Imaginary and unrealistic assumptions
6. Psychological & subjective law
7. Ignores income effect & substitution effect
8. Ignorance & laziness of consumers.

CHAPTER-II

LAW OF DEMAND & SUPPLY

Objective Type Questions

Q.1. Where is a demand curve considered as rectangular hyperbola:-
(a) e >1 (b) e=1 at all points
(c) e<1 (d) e=o
Correct Answer (b)

Q.2 By inferior good we mean.
(a) Demand falls with the rise in price
(b) Demand falls with the fall in price
(c) No effect of the change in price
(d) Demand rise with the fall in price
Correct Answer (c)

Q.3 Which of the following is not the exception of law of demand:-
(a) Articles of distinction (b) Giffen goods
(c) Ignorance (d) Normal goods
Correct Answer (d)

Q.4 When an individual"s income rises (while everything else remains constant) his demand for a normal goods.
(a) Rises (b) Falls
(c) Remains the same (d) Any of the above
Correct Answer (a)

Q.5 When the price of a substitute of commodity x falls, demand for x.
(a) Rises (b) Falls
(c) Remains unchanged (d) Any of the above
Correct Answer (b)

Q.6. When we know the quantity of a product that buyers wish to purchase at each possible price, we know
(a) Demand
(b) Supply
(c) Excess demand
(d) Excess supply
Correct Answer (a)

Q.7. A demand curve can shift because of changing
(a) Incomes
(b) Tastes
(c) Price of related goods
(d) All of the above
Correct Answer (d)

Long Answer type question

Q.1 Explain law of demand.

Ans. Meaning:- In economics demand means that a commodity demanded at a given price in given period.

Demand & want are synonyms in the ordinary sense of the term but in economics they are different. Want has three elements as given below:-

(i) Effective desire

(ii) Adequate resources and

(iii) Ready to spend these resources on wants. If any of the element is missing then it cannot be called a want

Prof Benham has defined:- "The demand for any time at a given price is the amount of it which will be bought per unit of time at that price".

Characteristics of demand

1. It is related with an effective desire
2. It is related with a particular quantity
3. It is related with a particular price.
4. It is related with a particular time.

Demand Schedule:-

When the quantity demanded of a commodity at different prices at a particular time is presented in the form of a table It is called demand schedule. The demand schedule

expresses the functional relationship between the price of a commodity and its quantity demanded. Such demand schedules are of two types as given below:-

(i) Individual demand schedule

(ii) Market demand schedule

Individual demand schedule

An individual demand schedule deals with the price of a commodity and its quantity demanded by an individual consumer at a particular time.

Table -1 Individual demand Schedule

Price	Quantity demanded
1	50
2	40
3	30
4	20
5	10

Market demand schedule:-

It is aggregates of all individual demand schedules. We take the quantity demanded of a commodity of different buyers at different price levels.

Table - 1 Market Demand Schedule

Price	Quantity Demanded			Total Demand
	X	Y	Z	
1	50	40	35	125
2	40	45	30	115
3	30	35	25	90
4	20	25	20	65
5	10	10	10	30

The demand schedules depict the following facts

(i) Demand schedules are formulated in the tabular form on the assumptions of other things being equal. Income taste habit and fashion of a consumer do not change, price changes

(ii) Demand schedules are imaginary

(iii) Market demand schedules are simple than those of individual demand schedules.

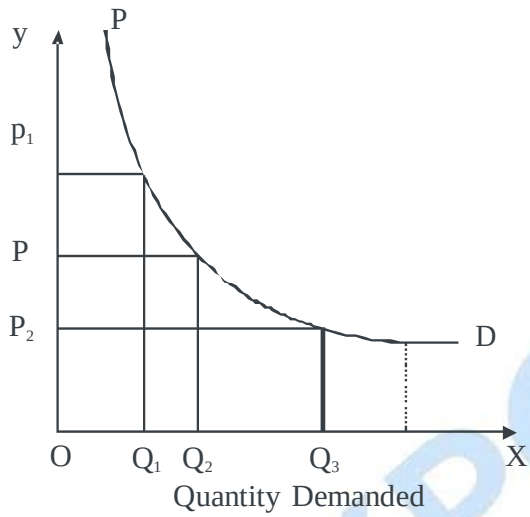
(iv) Demand schedule are affected by the time element

(v) There is imperfect competition in the market

(vi) Population & transport facilities also affect the demand schedules.

Demand curve

When the demand for a commodity at different prices is shown in graphical form we will get a line or cure which is called demand curve as shown below.



The demand curve (DD) shows an inverse relationship between the price of a commodity and its quantity demanded.

Law of demand:- According to the law, other things being equal with the increase in the prices, the quantity demanded of a commodity will decrease and with the decrease in the price, the quantity demanded will increase. Prof Marshall, "Ceteris paribus" the greater the amount to be sold the smaller must be the price at which it is offered in order that it may find purchasers or in other words the amount demanded increase with a fall in price and diminishes with a rise in price.

Assumptions of the law

(1) Money income of the consumer does not change

(2) Nature taste and preferences of consumer do not change.

(3) Prices of related goods (substitutes and complementary) do not change.

(4) New substitutes of the commodity are not available.

(5) Prices of good are not expected to change in near future.

(6) No change in the quantity of the goods

(7) State of wealth of consumer remains constant

(8) The commodity should not be status symbol.

Q.2. Why does law of demand operate? Or Why demand curve slopes downward to the right?

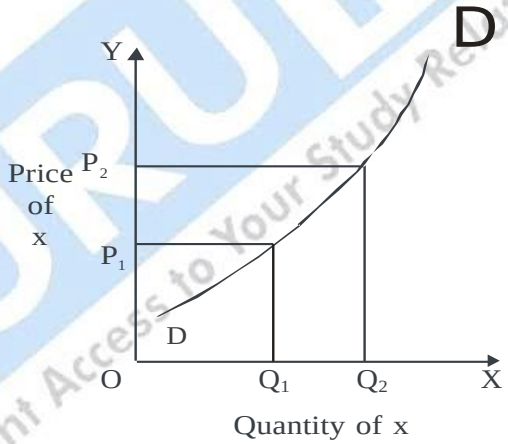
Ans. There is inverse relationship between the price of a commodity and its quantity demanded. The demand curve slopes downward to the right due to following reasons:-

1. Operation of the law of diminishing marginal utility.
2. Income effect
3. Substitution effect
4. Multiple use of the commodity.
5. Number of Buyers

   With the increase in the price the no of buyers will decrease and the no. of buyers will increase with the decrease in its price.

Q.3. Exception to the law of demand.

Ans. The law will operate only when certain assumptions are fulfilled. But there are some exception to the law of demand where the price of a commodity increases more is bought and with the decrease in price less is purchased. The slope of the demand curve will show are upward rising trend in such exception which is given in the following diagram.



In fig it is clear that with the increase in price the quantity demanded will also increase & vice-versa.

1. <u>The Giffen goods :-</u> Prof. Giffen has proved that with the fall in the price of inferior goods consumer will purchase less of such goods and more of superiors goods e.g. Dalda ghee decreases when the price of Dalda ghee decreases. This law will not apply in inferior or giffen goods.

2. Scarce goods and goods of status symbol. There are certain goods which are scarce and considered as prestigious goods. Such goods are purchased by rich section of society and they are considered as status symbol. If their prices are low they will not purchased by the rich section of society, hence the law will not operate.
3. Future expectation of price changes.
4. Goods relating to necessaries of life (perfectly in elastic)
5. Ignorance and laziness on the part of consumers
6. Specific brand & trade mark commodity
7. Small part of total expenditure
8. Speculative Activities

Q.4. What is difference between Extension & Increase in demand and contraction & decrease is demand.

Ans. Other things being equal when the quantity demanded of a commodity changes due to change in it price only then these changes are called extension in demand and contraction in demand.

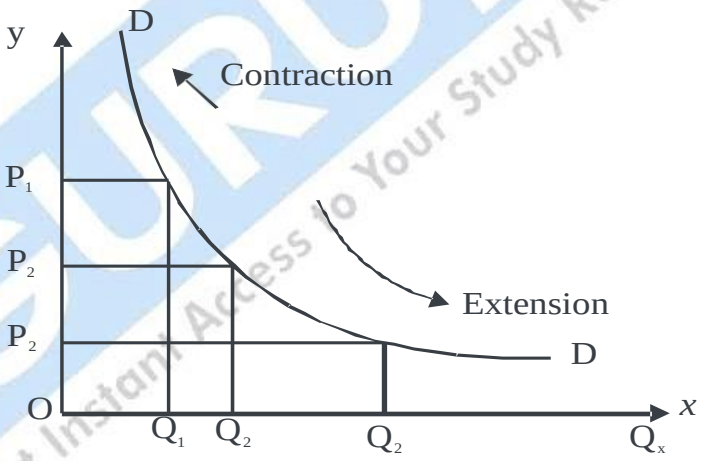
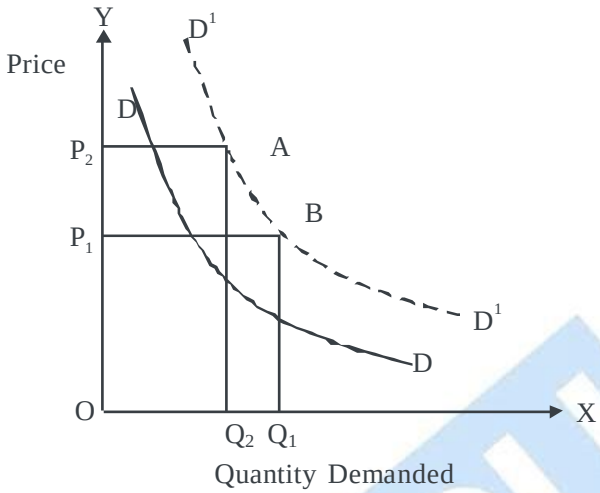


Fig. (contraction & extension of demand)

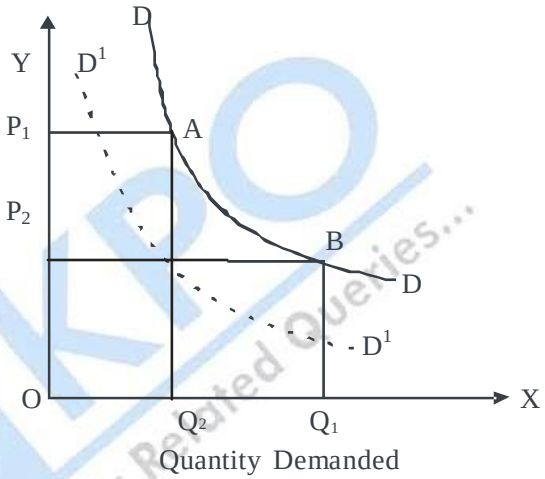
When the quantity demanded of a commodity increases with the fall in the prices of that commodity it is called extension in demand. Contrary to it when the quantity demanded of a commodity decreases due to rise in its price the demand is called contraction in demand. The contraction and extension is caused by the change in the price only. The contraction & extension in demand do not change the demand curve.

Shift in demand curve (Increase & decrease in demand curve

When other factors affecting the quantity demanded of commodity except the price of that commodity change the demand. The other factors are population change in price of related goods, change in income, taste, fashion of the consumer, govt. policy etc. On account of the changes the demand curve may either shift to the right of the original demand curve or it may shift to the left side of the demand curve.



Fig(A) Increase in demand



Fig(B) Decrease in demand

Q.5. Explain Types of demand.

Ans. 1. Price demand

2. Income demand

3. Cross demand

Price demand deals with the quantity demanded of a commodity at different price levels at a particular time. Other things being equal there is opposite relationship between the price of a commodity and its quantity demanded.

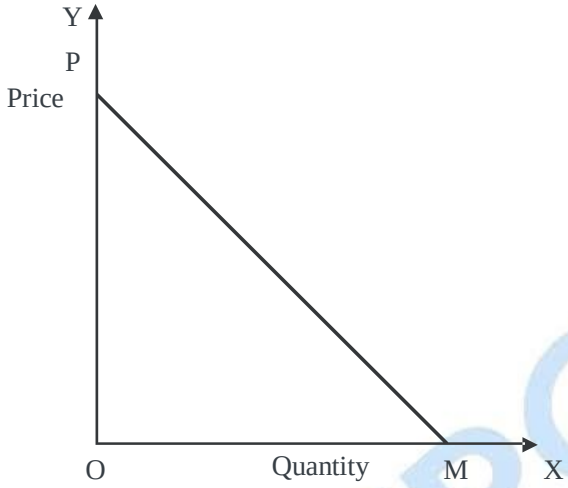
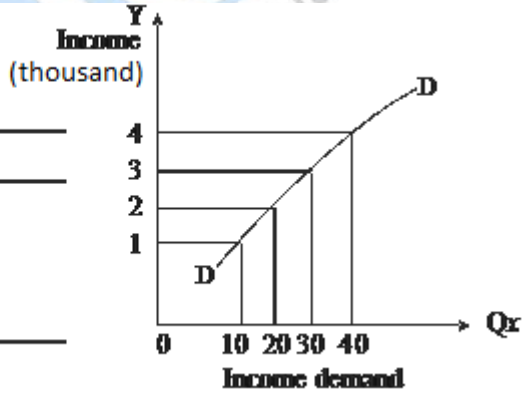


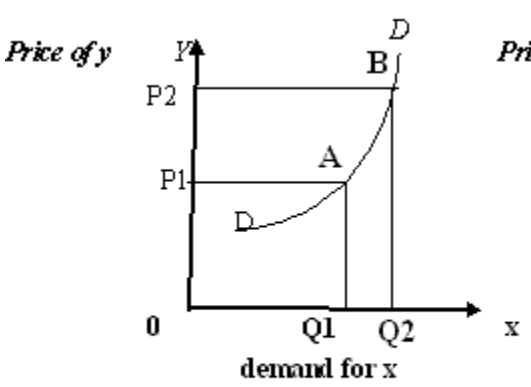
Fig 1. (Price Demand)

Income demand studies the relationship between the income of the consumer and quantity demanded of a commodity. There is direct relation between income & quantity demanded.

Level Income (V)		Qx
Rs.	1000	10
	2000	20
	3000	30
	4000	40



Cross demand When other things being equal the price of a related commodity changed what will be the quantity demand of that commodity is studied under the cross demand. Commodities may be either substitutes or complementary.



Fig(A) demand for Substitutes

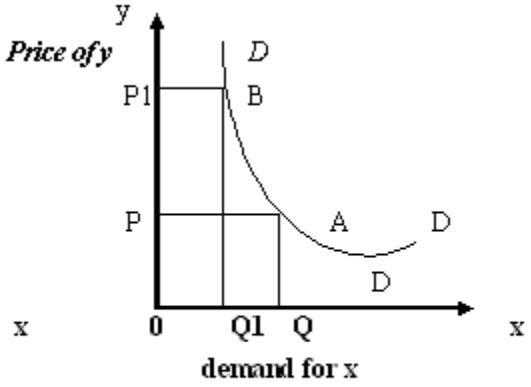


Fig (B) demand for complementary goods

Q.6. Explain factors Affecting demand or determinants of demand:-

Ans. The factors affecting the increase and decrease in demand are called the determinants of demand or factors affecting the demand. The determinants or factors affecting the demand are given below.

1. Price of commodity under study – Normal commodity
2. Prices of related goods
3. Income of consumer
4. Number of consumers
5. Distribution of Income & wealth
6. Size of population
7. Quantity of money supply
8. Quality of a commodity
9. Business conditions
10. Availability of credit facilities
11. Advertisement and sales promotion
12. Future expectation of price changes
13. Climate & seasons
14. Tastes, fashion & preference of consumer

Criticism of the Demand Analysis

1. Cardinal measurement of utility is not correct.
2. Utilities of goods are not Independent
3. Money is not an exact and stable measurement
4. Marginal utility of money does not remain constant
5. Income effect and substitution effect are not studied
6. Giffen goods are not studied

CHAPTER-III

Indifference Curve & Consumer's Surplus

Objective Type Questions

Q.1. An indifference curve is:-

(a) Convex to the origin

(b) concave to the origin

(c) Inclined at an angle to the origin

(d) One which goes through the origin

Correct Answer (a)

Q.2. The slope of indifference curve shows:-

(a) The price ratio

(b) The diminishing rate of substitution

(c) Factor substitution

(d) Level of indifference

Correct Answer (b)

Q.3. When the slope of PCC is positive the e_p is

(a) $e_p<1$ (b) $e_p>1$

(c) $e_p=1$ (d) $e_p=0$

Correct Answer (a)

Q.4. An indifference curve is a curve which shows different combination of two goods which yield.

(a) Negative satisfaction to the consumer

(b) Equal satisfaction to the consumer

(c) Minimum satisfaction to the consumer

(d) Zero satisfaction to the consumer

Correct Answer (b)

Q.5. The doctrine of consumer surplus was developed by:-

(a) Marshall (b) Pigou

(c) Robbins (d) Samuelson

Correct Answer (a)

Q.6. The indifference curve approach is also called by another name:-

(a) Cardinal approach (b) Ordinal approach

(c) Price theory (d) Micro economic

Correct Answer (b)

Q.7. A consumers demand curve can be derived from

(a) ICC (b) Engel‟s

(c) PCC (d) None of the above

Correct Answer (c)

Q.8. The Engel curve for a giffen good is

(a) Negative sloped (b) Positively sloped

(c) Vertical (d) Horizontal

Correct Answer (a)

Long Answer type questions

Q.1. What are the indifference curves? Explain income consumption curve and price consumption curve with the help of indifference technique.

Ans. Indifference curves were first introduced by the English economist F.Y. Edgeworth in the 1880s. The concept was refined and used extensively by the Italian economist Vilfredo Pareto in the early 1900_S Indifference curves were popularized and greatly extended in application in the 1930s by two other English economists R.G.D allen and John R. Hicks. Indifference curves (I.Cs) are a crucial tools of analysis because they are used to represent an ordinal measure of the tastes and preferences of the consumer and to show how the consumer maximizes in spending income.

Indifference Curves

Consumers tastes can be examined with ordinal utility. An ordinal measure of utility is based in these assumptions:-

(a) Consumer is indifferent between two goods.

(b) The tastes of consumer are consistent or transitive.

(c) More of a commodity is preferred to less.

Indifference Schedule

Commodities x	Commodity Y	Combination
1	10	A
2	6	B
4	3	C
7	1	D

(1) **Negatively sloped and are convex to the origin because** if one basket of goods x and y contains more of x, it will have to contain less of y than another basket in order for the two baskets to give the same level of satisfaction and be on the same indifference curve.

Characteristics of Indifference Curves

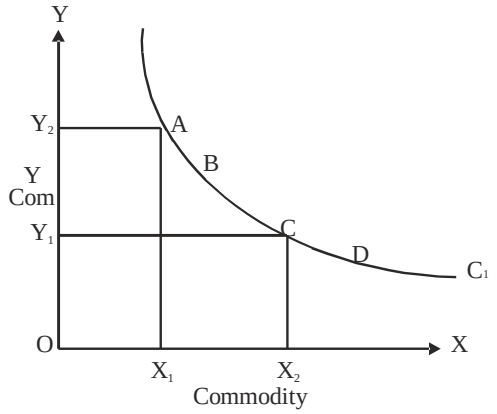


Fig-1. Indifference curve convex to the origin

(2) A Higher indifference curves refers to higher level of satisfaction. Different indifference curves simply provide an ordering or ranking of the individuals preference.

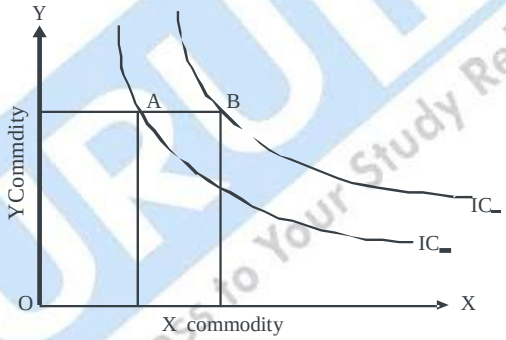


Fig.-2 A higher indifference curve shows the higher level of satisfaction

3. Indifference curves cannot intersect. Since C is on curve I& II, it should give the same satisfaction as A & B, but this is impossible because B has more of X & Y than A. Thus indifference curves cannot intersect.

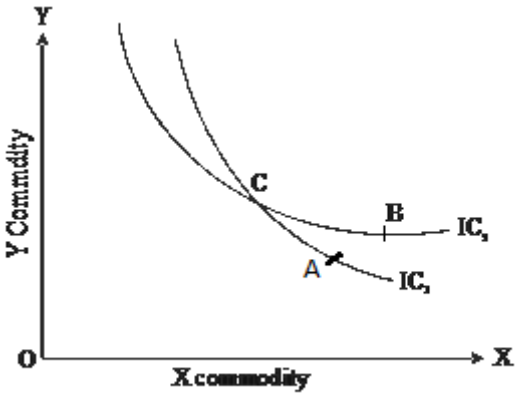


Fig 3 : Indifference curve cannot intersect

4. **Diminishing rate of marginal substitution (MRSxy)** Marginal rate of Substitution of x for y is the amount of y which the consumer is prepared to give up for the gain of one additional unit of x so that his level of satisfaction remains the same.

Indifference Schedule

X	Y	MRS_{xy}
1	12	-
2	8	4 (1:4)
3	5	3 (1:3)
4	3	2 (1:2)
5	2	1 (1:1)

Fig

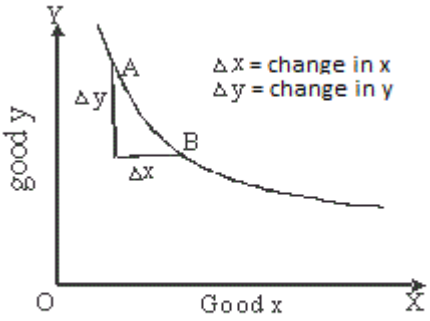


Fig : Diminishing rate of marginal substitution

Q.2. Explain ICC & PCC.

Ans. **Income Consumption Curve and Engel Curve**

By changing the consumer‟s money income while holding prices and tastes constant we can derive the consumer‟s income consumption curve. The income consumption curve is the locus of (i.e. joins) consumer optimum points resulting when only the consumers income varies. From the income consumption curve we can then derive the consumers Engel curve.

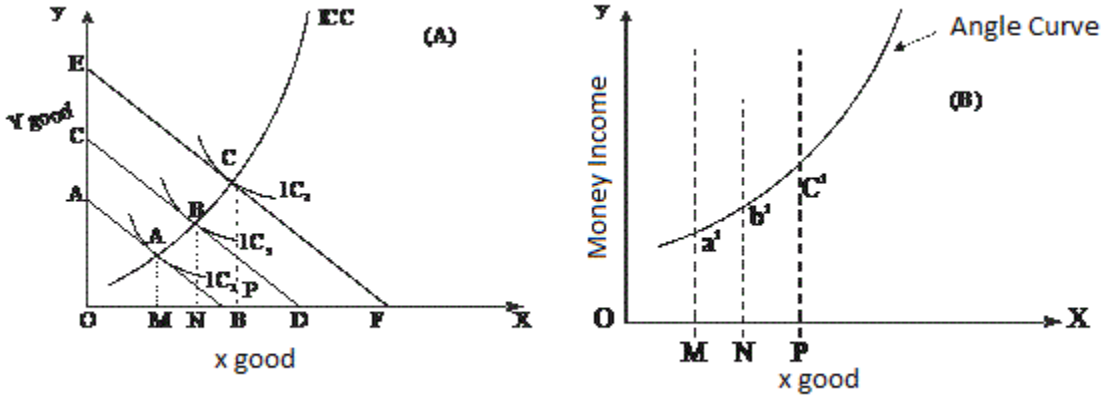


Fig 5: Income consumption Curve & Engel Curve

In fig 5 (A) Income consumption curve is shown with budget lines AB, CD & EF, Indifference curves IC_1, IC_2, IC_3. The individual maximizes utility at points a,b & c respectively. By Joining optimum point a, b & C we get the ICC.

By plotting income on vertical axis and the various optimum quantities purchased of good & along the horizontal axis, we can derive the corresponding Engel curve a"b"c" in fig 5 (B).

Fig: 5 Income consumption curve & Engel curve. Engel curves are named after Ernst Engel, The German statistician of the second half of the nineteenth century who pioneered studies of family budgets and expenditure patterns. Sometimes Engel curves show the relationship between income and expenditure or various goods rather than the quantity purchased of various goods however prices are held constant we get the same result (i.e. the same Engle curve.)

Normal & Inferior goods

A normal good is one of which the consumer purchase more with an increase in income. An inferior goods is one of which the consumer purchases less with an increase in income.

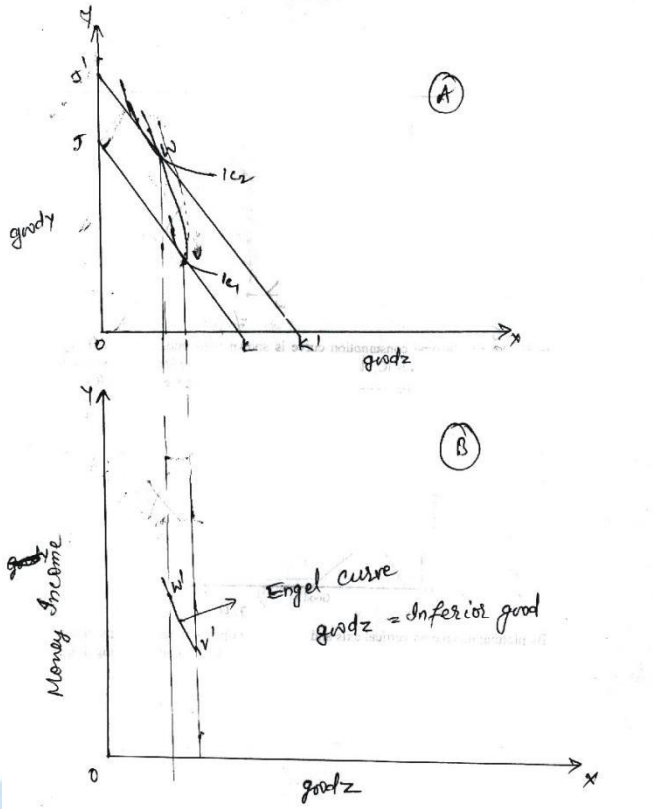


Fig: 6 Income consumption curve and Engel curve for an inferior good.

In fig (a) with budget lines JK & J"K", IC curves. IC_1 & IC_2, the individual maximizes utility at points V & W, respectively. By joining points V & W, we get the ICC.

By then plotting income on the vertical axis and the optimum quantities purchased of goods along the horizontal axis, we derive corresponding Engel curve V „ W " (B) since the ICC & Engel curve are negatively sloped goods is inferior good.

Price Consumption Curve (PCC)

The PCC for good x is the locus of (i.e. Joins) consumer optimum points resulting when only the price of good x varies. From the price consumption curve we can then derive the consumers demand curve for good x.

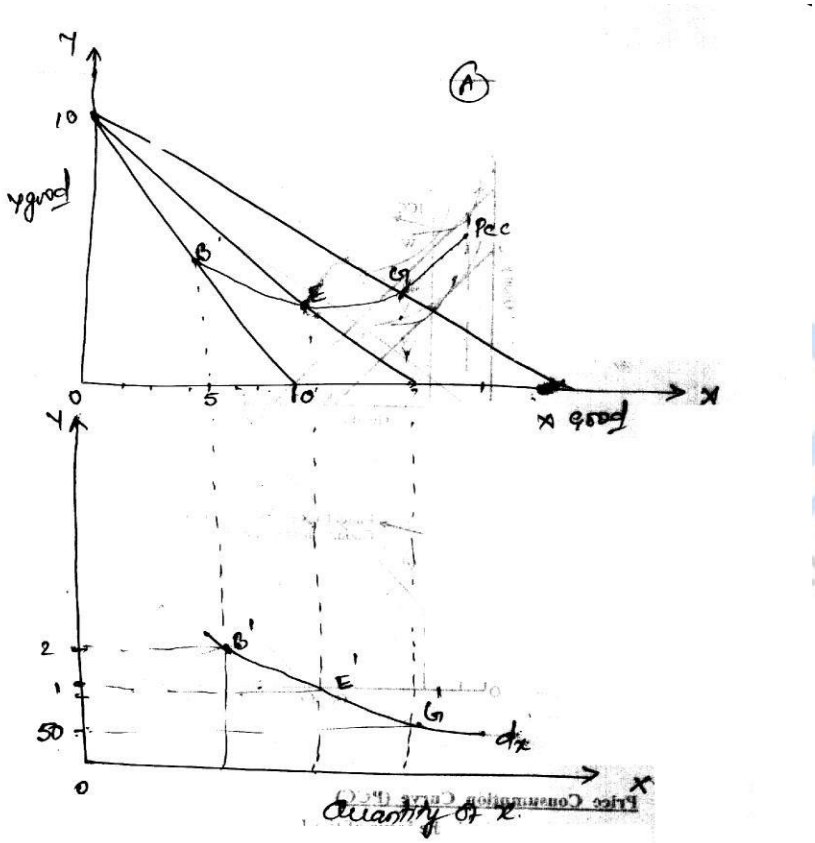


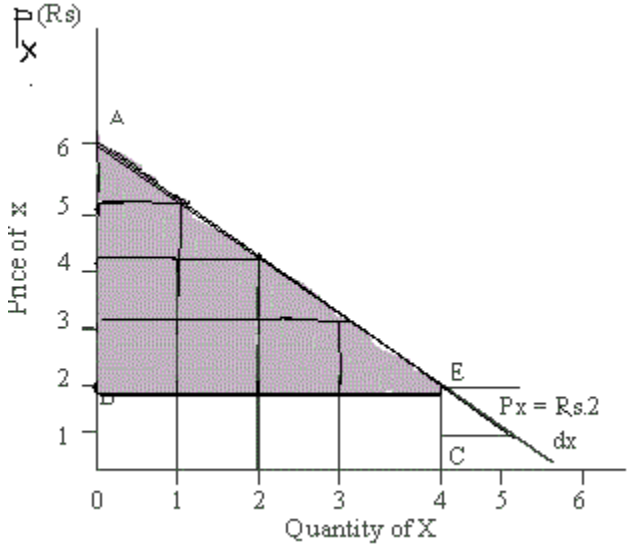
Fig:- Price-consumption curve & individual's Demand curve.

In fig (A) shows that with I=Rs. 10 Py =Rs 1 the consumer is at an optimum at point B by purchasing 2x with Px= Rs. 2 at point E by purchasing 6x with Px= Rs.1, and at point G by purchasing 10x with Px= Rs.0.50 by joining points,BEG we get the PCC for good x. In fig (b) by plotting the optimum quantities of good x on the horizontal axis and the corresponding prices of good X on the vertical axis, we derive the individual negatively sloped demand curve for good x, dx.

Q.3. Explain the concept of consumer's surplus and discuss its importance in economic analysis.

Ans. Consumer"s surplus is the difference between what a consumer is willing to pay for a good and what he or she actually pays. It results because the consumer pays for each unit

of the good only as much as he or she is willing to pay for the last unit of the good (which gives less utility than earlier units). We can see how consumer surplus arises and how it can be measured with the aid of fig.



It is clear from the fig, the difference between what the consumer is willing to pay for 4x (Rs5+Rs4+Rs3+ Rs2=Rs14) and what he or she actually pays (Rs8) is the consumer surplus (the shaded area that equals Rs 6). If good x could be purchased in infinitesimally small units, the consumer surplus would equal the area under d_x and above p_x = Rs 2 = (area AEB =Rs. 8) To summarize the consumer would be willing to pay Rs 5 for the first x, Rs 4 for second x, Rs3 for the third, and Rs2 for the fourth, for a total of Rs14 for all for x. Thus Rs 14 is the total benefit that the consumer receives from purchasing four x. However, if the market price is Rs 2/x, the consumer can purchase all four x at a total cost of (i.e by actually spending) only Rs 8. Because the consumer would be willing to pay Rs 14 for the Ist 4, x rather than go entirely without them but actually pays only Rs 8, he or she enjoys a net benefit or consumer surplus equal to the difference (Rs 6).

If Xs could have been purchased in smaller and smaller fractions of a whole x, then the consumer surplus would have been given by the entire area under demand curve dx above the market price of Rs 2. That is the consumer surplus would have been the area of triangle AEB, which is (1/2)(4)(4)=Rs 8. This exceeds the consumer surplus of Rs 6, that we found by adding only the shaded areas in the figures, OAEC = Δ AEB + □OBEC. Since the consumer only pays Rs 8(OBEC) the consumer surplus is Rs 8 (AEB). If Px fell to Rs 1, the consumer would purchase 5x and the consumer surplus would be Rs

12.50 (The area under dx and above Px=Rs1 in the figure) if x could be purchased by infinitely small fractions of a whole x.

The concept of consumers surplus was first used by Jules Dupuit in 1844 and was subsequently refined and popularized by Alfred Marshall. The helped resolve the so-called water diamond paradox, which plagued classical economists until 1870. Why is water , which is essential for life, so cheap, while diamonds, which are not essential, so expensive? The explanation is that because water is so plentiful (relatively cheap) and we use so much of it the utility of the last unit is very little (washing the car), and we pay as little for all units of water as we are willing to pay for the last non essential unit of it. On the other hand diamonds are scarce is relation to demand and because we use very little of them, the utility and price of them last unit are very great. The total utility and the consumer surplus from all the diamonds purchased however demand depends or marginal utility, not on total utility in a desert, the first glass of water would be worth much more than any glassful of diamonds.

CHAPTER-IV

Elasticity of Demand

Objective Questions

Q.1. When the slope of PCC is positive the ep is

(a) $e_p<1$ (b) $e_p>1$

(c) $e_p=1$ (d) $e_p=0$

Correct Answer (b)

Q.2. Cross elasticity of demand between two substitutes goods will be-

(a) Positive (b) Negative

(c) Zero (d) Any of the above

Correct Answer (a)

Q.3. When is a demand curve considered as rectangular hyperbola.

(a) e >1 (b) e=1 at all points

(c) e<1 (d) e=o

Correct Answer (b)

Q.4. Which mathematical selection is correct

(a) $e = \frac{MR}{MR-AR}$ (b) $e = \frac{AR}{AR-MR}$

(c) $e = \frac{AR}{MR-AR}$ (d) $e = \frac{MR}{AR-MR}$

Correct Answer (b)

Long Answer type questions

Q.1. Explain the following.

(i) Methods of measurement of elasticity of demand (ii) Relation between AR, MR & elasticity of demand (using proper diagram and equations). Prove that

$$MR = \left(AR - \frac{AR}{n}\right)$$

Ans.1. (i) Methods of measurement of Elasticity of demand.

(a) The price elasticity of demand is given by the percentage change in the quantity demanded of a commodity divided by the percentage change in its price. Letting η (the Greek letter eta) stand for the coefficient of price elasticity of demand. ΔQ for the change the quantity demanded and ΔP for the change in price we have the formula for the price elasticity of demand.

$$\eta = \frac{\Delta Q / Q}{\Delta P / P} = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$$

Since quantity & price move in opposite directions the value of η is negative. To compare price elasticities, however, we use their absolute value (i.e their value without the negative sign).

(b) Point elasticity of demand or the elasticity at a particular point on the demand curve. More frequently we are interested in the price elasticity between two points on the demand curve. We then calculate the arc elasticity of demand. We use the average of the two prices and the average of the two quantities in he calculations, letting P_1 refers to the higher of the two prices (with Q, the quantity at P_1) and P_2 refer to the lower of the two prices (with Q_2 the corresponding quantity). We have the formula for arc elasticity of demand.

$$\eta = \frac{\Delta Q}{\Delta P^1} \frac{(P_1 + P_2)/2}{(Q_1 + Q_2)/2} = \frac{\Delta Q}{\Delta P^1} \frac{P_1 + P_2}{Q_1 + Q_2}$$

The price elasticity of demand is usually different at and between different points on the demand curve and it can range anywhere from zero to very large or infinite. Demand is said to be elastic if the absolute value of η equals 1, and in elastic if the absolute value of η is smaller than 1.

1. Price Elasticity Graphically:-

We can also measure graphically the price elasticity at any point on a linear or nonlinear demand curve and it can range anywhere from zero to very large. To measure the price elasticity at point E on Dx in the left panel of fig. 5.2 we proceed as follows.

We draw tangent AEH to point E on Dx and drop perpendicular EJ to the quantity axis. The slope of tangent line AEH is negative and constant throughout and can be measured by $= \frac{\Delta P}{\Delta Q} \frac{(P1+P2)/2}{(Q1+Q2)/2} = -\frac{JE}{JH}$

The I[st] component of the price elasticity formula is the inverse of the slope of the demand curve or $\frac{\Delta Q}{\Delta P} = -\frac{JH}{JE}$

The 2[nd] component of the price elasticity formula is $\frac{P}{Q} = -\frac{JE}{OJ}$ .Reassembling the two components of the elasticity formula, we have

$$n = \frac{\Delta Q}{\Delta P}\frac{P}{R} = \frac{JH}{OJ} = -\frac{6}{6} = 1$$

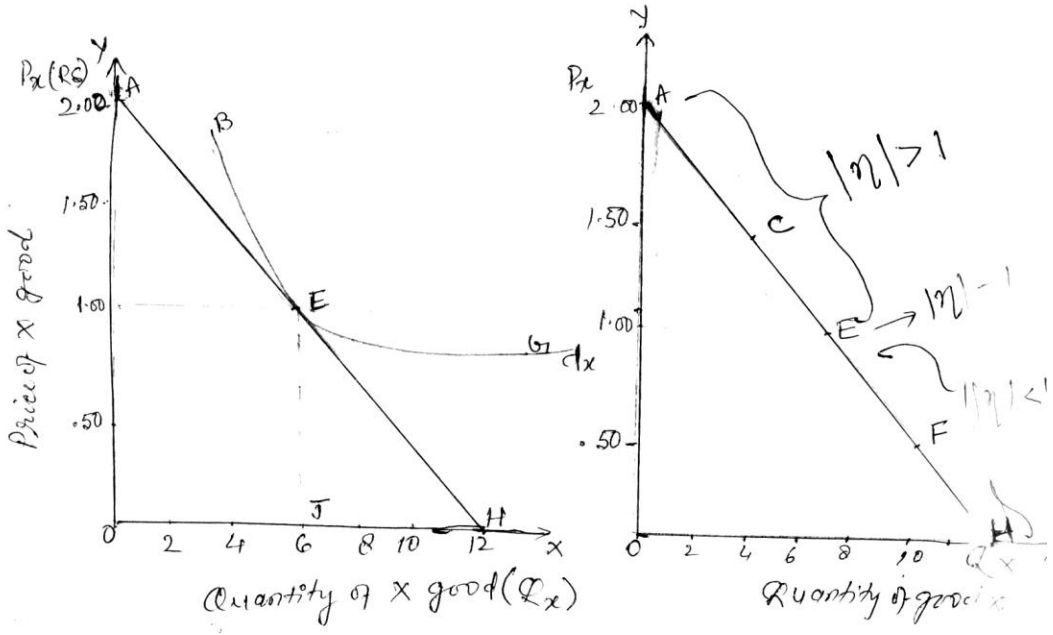


fig 5:2 Measurement of Price elasticity of demand Graphically

In the left panel the price elasticity at point E on Dx is measured by drawing tangent AEH to point Eon Dx and dropping perpendicular EJ to the horizontal axis. At point E, η=-JH/OJ=-6/6=-1 in the right panel the absolute value of η =1 at point E (the midpoint of Dx), η >1 above the midpoint, and η <1 below the midpoint.

Price Elasticity and Total Expenditure:-

An important relationship exists between the price elasticity of demand and the total expenditure of consumer on the commodity. This relationship is often used in economics. It postulates that a decline in the commodity price results in an increase in total expenditure unchanged, if demand is elastic, leaves total expenditure unchanged if demand is unitary elastic and results in a decline in total expenditure if demand is inelastic.

Table : Total Expenditure and price elasticity of dem andAbsolute value

Point	Px	QX	Total Expenditure	Absothte value
A	2.00	0	0	∞
C	1.50	3	4.5	3
E	1.00	6	6.0	1
F	0.50	9	4.5	1/3
H	0	12	0	0

It is clear from table that between points A and E,(η)>1 and Total expenditure on the commodity increase as the commodity price declines. The opposite is true between points E and F over which (η)<1. Total expenditure maximum at point E. The general rule summarizing the relationship among total expenditure, price and the price elasticity of demand is that total expenditure and price move in opposite direction if demand is elastic and in the same direction if demand is inelastic.

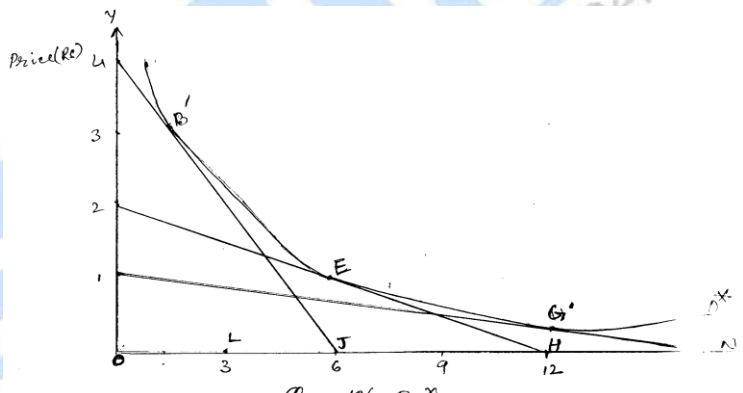


Fig (5:3) Unitary Elastic Demand curve

Demand curve D^x has unitary elasticity throughout. Thus, η=-JH/OJ=-6/6=-1 at point E, η =-LJ/OL=-3/3=-1 at point B^1, and η =-HN/OH=-12/12=-1 at point G^1. Total expenditure (PQ) are the same (Rs. 6) at every point on D*. This demand curve is a rectangular hyperbola.

Income Elasticity of Demand

As we know that, Engel curve as showing the amount of a commodity that a consumer would purchase per unit of time at various income levels. While holding price and tastes constant. We can measure the responsiveness or sensitivity in the quantity demanded of a commodity at any point on the Engel curve by the income elasticity of demand. This is defined as.

$$\eta = \frac{Q/Q}{I/I} = \frac{Q}{I}\ \frac{I}{Q}$$

Where ΔQ is the change in the quantity demanded, Δ I is the change in income, Q is the original quantity, and I is the original money income of the consumer. A commodity is normal if η_l is less than 1 and as a luxury if η_l is greater than 1.In the real world most broadly defined commodities such as food, clothing, housing, health care, education and recreation are normal goods. Inferior goods are usually narrowly defined in expenditure goods such as bologna, for which good substitutes are available, among normal goods, food & clothing are necessities while education and recreation are luxuries.

Income Elasticity and classification of good x

I	Ox	Δ% Ox	Δ% I	η_1	Classification
10	2	-	….	2.00	Luxury
15	4	100	50		
20	5	25	33	0.76	Necessity
30	6	20	50	0.40	Necessity
40	4	33	33	-1.00	Inferior

Cross Elasticity of Demand:-

Commodities x and y are substitutes if more of x is purchased when the price of y goes up for e.g. consumers usually purchase more coffee when the price of tea rises. The coffee and tea are substitutes. Other examples of substitutes include butter and margarine, hamburgers and hot dogs, Coca-Cola and Pepsi electricity & gas and so on.

On the other hand commodities x & y are complements if less of x is purchased when the price of y goes up. Thus lemons and tea are complements. Other examples of commodities that are complements are coffee & cream, hamburgers and buns, hot dogs and mustard, cars and gas line and so on.

An increase in the price of a commodity leads a reduction in the quantity demanded of the commodity (a movement along the demand curve for the commodity) but causes the

demand curve for substitute to shift to the right and the demand curve for a complement to shift to the left for example and increase in the price of tea will cause the demand for coffee (a substitute of tea) to shift to the right (so that more coffee is demanded at each coffee price) and the demand for lemons (a complement of tea) to shift to the left (so that fewer lemons are demanded at each lemon price.

We can measure the responsiveness or sensitivity in the quantity purchased of commodities x as a result of change in the price of commodity y by the cross elasticity of demanded (η_{xy}). This is given by $\eta xy = \frac{\Delta Qx/Qx}{\Delta Py/Py} = \frac{\Delta Qx}{\Delta Py}, \frac{Py}{Qx}$

Where ΔQ_x is the change in the quantity purchased of x, ΔP_y is the change in the price of y P_y is the original price of y. and Q_x is the original quantity of x. In measuring η_{xy} we hold constant P_x, consumers incomes , their taste, and the number of consumers in the market.

If η_{xy} is greater than zero x and y are substitutes, because an increase in P_y leads to an increase in Q_x as x is substituted for y in consumption. On the other hand if n_{xy} is less than zero, x & y are complements, because an increase in P_y leads tea reduction in (Q_y) and Q_x.

independent commodities. This may be the case with cars and pencils telephones and chewing gum, pocket calculators, and beer and so on.

Relationship Among Marginal Revenue, Price & Elasticity

Let p and Q equal the price and the quantity of a commodity respectively, there the total revenue of the seller of the commodity (TR) is given by TR=PQ - (i)

And the marginal revenue is MR = $\frac{d(TR)}{dQ} = P + Q\ \frac{dp}{dq} - (ii)$ $(by\ product\ rule)$

Manipulating expression (ii) Mathematically we get MR = p $\left(1 + \frac{Q}{P}.\frac{dp}{dq}\right) = P\ \left(1 + \frac{1}{\eta}\right)$

Where η is the coefficient of price elasticity of demand for example if P=Rs.12 and η=-3, MR= Rs. 8,. If η = ∞, P= MR =Rs. 12.

Or MR = p + $\frac{P}{n}$

Or MR =AR - $\frac{AR}{n}$

(Since p = AR)

CHAPTER-V

PRODUCTION THEORY

Objective Types Questions

Q.1. The line joining points of consumers equilibrium resulting when only the consumers income is varied is called.
(a) The demand curve
(b) The income consumption curve
(c) The Engel curve
(d) The price consumption curve.
Correct Answer (b)

Q.2. Within the relevant range isoquants are:-
(a) Negatively sloped (b) Convex to the origin
(c) Cannot cut each other (d) All of the above
Correct Answer (d)

Q.3. The cost that a firm incurs in purchasing any factors of production is referred to as:-
(a) Explicit cost (b) Implicit cost
(c) Variable cost (d) Fixed cost
Correct Answer (c)

Q.4. When the demand curve is elastic, MR is :-
(a) One (b) Zero
(c) Positive (d) Negative
Correct Answer (c)

Q.5. The concept of transfer earning is associated with :-
(a) Theory of monopolistic (b) The theory of interest

(c) The modern theory of rent (d) The theory of profit
Correct Answer (c)

Q.6. All the following curves are U shaped except:-
(a) The AC curve (b) the AFC curve
(c) The AC curve (d) The MC curve
Correct Answer (b)

Q.7 Given the supply of a commodity in the market period the price of a commodity is determined by :-
(a) The market demand curve alone (b) The market supply curve alone
(c) The market demand curve and market supply curve
(d) None of the above
Correct Answer (c)

Q.8. When are the perfectly competitive firm and industry both in long run equilibrium?
(a) P=MR=SMC=LMC
(b) P=MR=SAC=LAC
(c) P=MR==lowest point on the LAC curve
(d) All of the above
Correct Answer (d)

Q.9. Slope of isoquant is equal to:-
(a) $MRTs_{LK}$ (b) P_L/P_K
(c) L/k (d) Q/L
Correct Answer (a)

LONG ANSWER TYPE QUESTION

Q.1. Explain the three stages of production why is it that the second stage of production is considered the most relevant stage for factor use in production. Discuss using suitable diagram.

Ans. Production refers to the transformation of resources into outputs of goods and service. The output of a firm can either be a final commodity such as automobiles or an intermediate product such as steel (which is used in the production of automobiles and other goods). The output can also be service rather than a good.

Classification of Inputs:-

Firms transform inputs into outputs. Inputs, resources or factors of production are the means of producing the goods & services demanded by society. Inputs can be classified broadly into labour or human resources (including entrepreneurial talent). Capital or investment goods, and land or natural resources. Particularly important among input is entrepreneurship, which refers to the ability of some individuals to see opportunities to combine resources in new and more efficient ways to produce a particular commodity or to produce entirely new commodities. The motivation is the great profit possibilities that an entrepreneur may believes to exist. The entrepreneur either uses his or her resources to exploit these profit opportunities or more likely attempts to convince other people with large sum of money to put some of that money at his or her disposal to introduce new production technique or new product and share in the potential profits. Inputs can be further classified into fixed and variable. Fixed inputs are those that cannot be varied or can be varied only with excessive cost during the time period under consideration. Examples of fixed inputs are firms, plant and specialized equipment.Variable inputs on the other hand are those that can be varied easily and on short notice during the time period under consideration examples of these are raw materials and many types of workers particularly those with low levels of skills. Thus whether an input is fixed or variable valuable depends on the time horizon being considered. This time period during which at least one input is fixed is called the short run and the time period during which all inputs are varied is called the long run.

Production with One Variable Input

We are dealing with the short run when only one input is variable.

Total Average and Marginal Product

A production function is a unique relationship between inputs & outputs. It can be represented by a table, a graph or an equation and shows the maximum output of a commodity that can be produced per period of time with each set of inputs. Both output & inputs are measured in physical rather than monetary units. Technology is assumed to remain constant. A simple short run production function is obtained by applying various amounts of labour to form one acre of land and recording the resulting output or total product (TP) per period of time. This is illustrated by the first two columns of table.

Table : Table, Average & Marginal Product (in the cultivation of wheat on one Acre of land)

Lobour	Output or Total Product (TP_L)	Average Product & (AP_L)	Mangial Productor (MP_l)
0	0	-	-
1	3	3	3
2	8	4	5
3	12	4	4
4	14	3.5	2
5	14	2.8	0
6	12	2	-2

The 2nd column of table shows, with one unit of labour (l L) TP =3 units of wheat and with 2L, TP= 8 units of wheat and so on.

The total (Physical) output or total product (TP) divided by the quantity of labour employed (2) equals the average product of labour (AP_L). On the other hand the change in output or total product per unit change in the quantity of labour employed is equal to the marginal product of labour (MP)

Column 3 in table gives the AP_L (column 2 divided by col .1) The MP_L in col. 4s obtained by subtracting successive quantities of the TP in col. 2. Plotting the total average and Marginal product quantities of table gives the corresponding product curve shown in figure.7

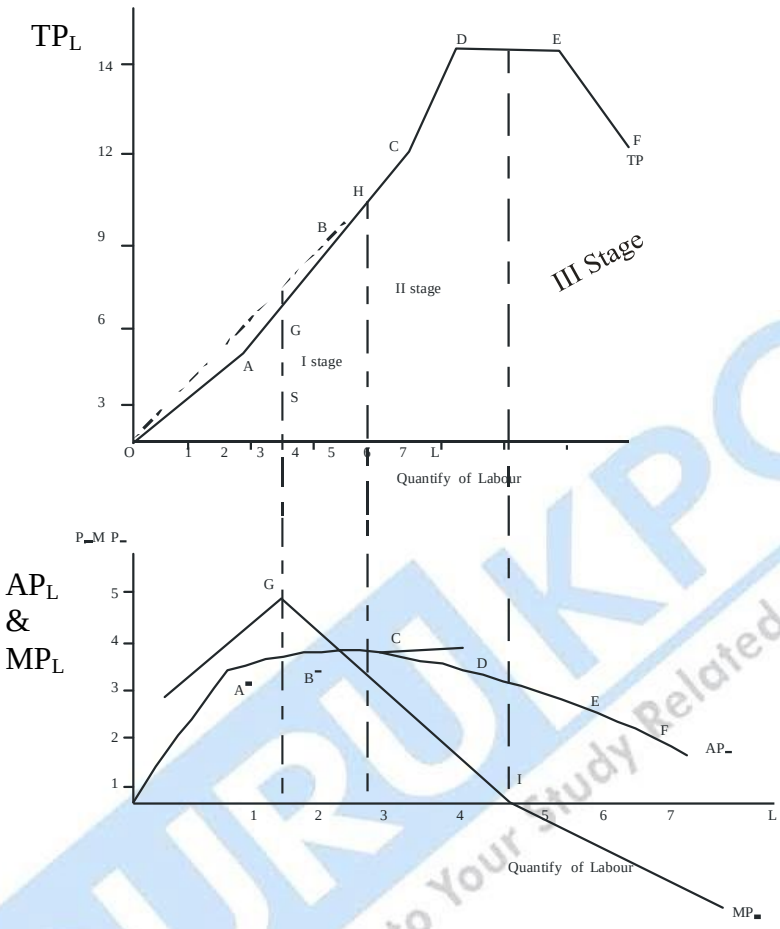


Fig:- Geometry of Total Average and Marginal Product curves

The AP_L (given by the slope of the line from the origin to a point on the TP curves) rises up to point H and declines there after (but remains positive as long as TP is positive).

The MP_L given by the slope of the tangent to the TP curve rises up to point G becomes zero at I‟ and is negative thereafter. When the AP curve rises, the MP_L is above it where the AP_L falls the MP_L is below it and when AP_L is highest $MP_L = AP_L$

The Law of Diminishing Returns

The decline in the MP_L curve in fig is a reflection of the law of diminishing returns. This is an empirical generalization or a physical law not a proposition of economics. It postulates that as more units of a variable inputs are used with a fixed amount of other inputs, after a point, a smaller and smaller return will accrue to each additional unit of the

variable input. This occurs because each additional unit of the variable input has less and less of the fixed inputs with which to works.

In fig. the law of diminishing return for L begins to operate from point G (II stage). Further additions of L will eventually lead to zero and then to negative MP_L (III stage). So stage II is considered most relevant stage for factor use in production.

Q.2. Explain the following

(i) Isoquants

(ii) Returns to scale

(iii) Least cost combination

Ans. (i) Isoquants:- An iso quant shows the various combinations of two inputs (say, labour and capital) that can be used to produce a specific level of output. A higher iso-quant refers to a larger output where as a lower isoquant refers to a smaller output. If the two variable inputs (labour & capital) are the only inputs used in production we are in the long run. If the two variable inputs are used with other fixed inputs (say land) we would still be in the short run.

Characteristics of Isoquants:-

(i) They are negatively sloped in the economically relevant range are convex to the origin.

(ii) All points on an isoquant refer to the same level of output.

(ii) Higher isoquant refers to a larger output

(iii) They cannot cut each other

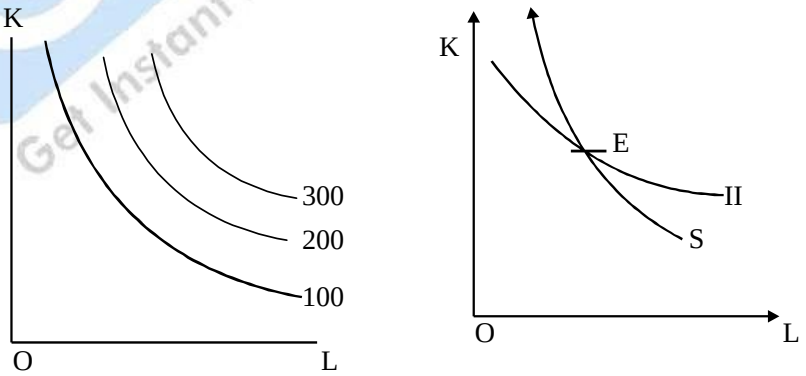


Fig. Isoquants

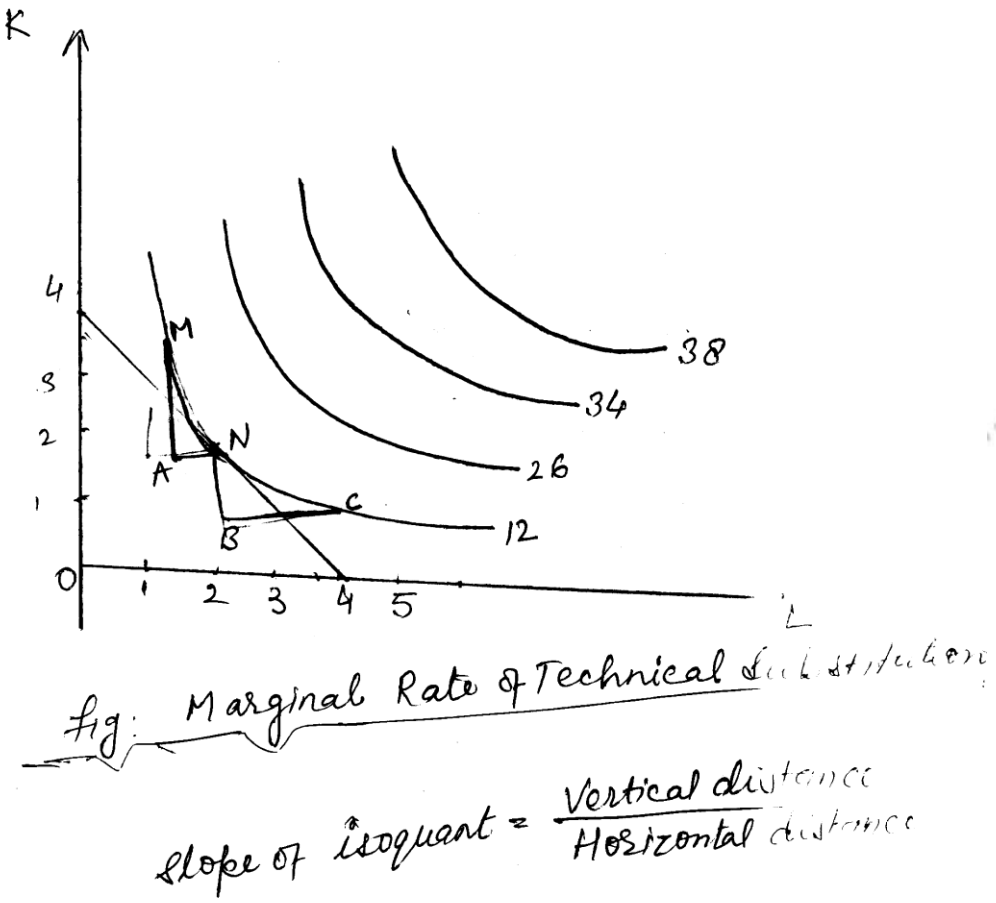


Fig:- Marginal Rate of Technical Substitution

In fig. Between point M and point N on the isoquant for 12 units of output (12Q) the marginal rate of technical substitution of labour for capital ($MRTS_{LK}$) equals 2.5 between point N and C, $MRTS_{LK}$ =1/2. At point N, $MRTS_{LK}$ =1 (the absolute slope if the tangent to the isoquant N). The $MRTS_{LK}$ is also equal to MP_L/MP_K. As we know that all points on an isoquant refer to the same level of output. Thus for a movement down a given isoquant the gain in output from using more labour must be equal to the loss in output from using less capital specifically the increase in the quantity of labor used (ΔL) times the marginal product of labour (MP_L) must equal the reduction in the amount of capital used (ΔK) times the marginal product of capital (MP_K). That is,

$(\Delta L)\ (MP_L) = -\ (\Delta K)\ (MP_K)$

So that $\frac{MP_l}{MP_K} = -\frac{\Delta K}{\Delta L} = MRTS_{LK}$

Thus $MRTS_{LK}$ is equal to the absolute value of the slope of the isoquant and to the ratio of the marginal productivities.

Economic Region of Production

The firm would not operate on the positively sloped portion of an insquant because it could produce the same level of output with less capital and less labor.

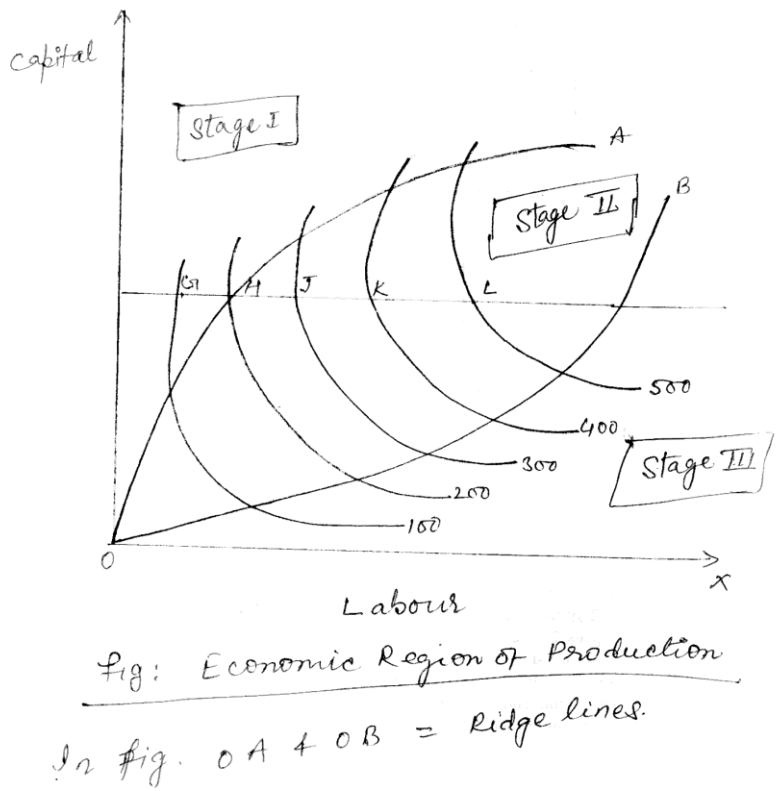


Fig: Economic Region of Production

Isoquants are positively sloped to the right of ridge line OB and to the left of or above ridge line OA. The firm would never produce at a point such as for S in the positively sloped portion of the isoquant because it could produce the same output with less of both inputs.

For eg the firm would not produce 34 Q at point P in fig because it could produce 34Q by using the smaller quantity of labour and indicated by point R. Similarly the firm would not produce. 34Q at point T in the less L & K since input are not free the firm would not want to produce in the positively sloped range of isoquants. Ridge lines separate the relevant (ie negatively sloped) from the is relevant (or the positively sloped) portions of the isoquants. Thus we conclude that the negatively sloped portion of the isoquant within the ridge line represents the economic region of production where the MP_L and MP_K are both positive but declining. Producer will never want to operate.

Ans. (ii) <u>Returns to Scale</u>

The word scale refers to the long run situation where all inputs are changed in the same proportion. The result might be constant, increasing or decreasing returns. Constant returns to scale refers to the situation where output changes by the same proportion as inputs. For example if all inputs are increased by 10% output also rises by 10%.

Increasing returns to scale refers to the case where output changes by a larger proportion than inputs. For eg. If all inputs are increased by 10%, output increases by more than 10%. If all inputs are doubled, output, more than doubles, finally in the decreasing returns to scale output changes by a smaller proportion than inputs. Thus increasing all inputs by 10% increases output by less then 10% and doubling all inputs less than doubles onputs.

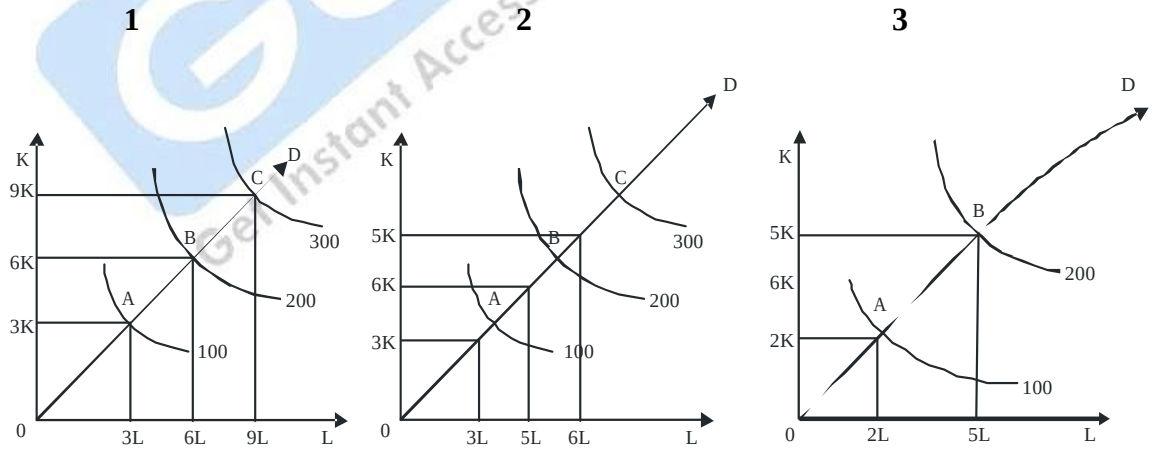


Fig : (1) constant (2) Increasing (3) and Decreasing Returns to scale.

In fig 1, doubling inputs from 3L&3K to 6K&6L double output from 100 to 200 and so on. Thus OA=OB=OC. In fig 2, output can be doubled or tripled by less than doubling or tripling the quantity of inputs. Thus OA>AB>BC and the isoquants become closer together. In fig 3, output changes proportionately, less than labour and capital, and OA<AB<BC.

Ans(iii) Least cost combination or choice of Optimal factor combination or producers equilibrium.

A profit maximizations firm faces two choices of optimal combination of factors (inputs): First to minimize its cost for a given output and second to maximize its output for a given cost. Thus the least cost combination of factors refers to a firm producing the largest volume of output from a given cost when the factors are combined in an optimum manner.

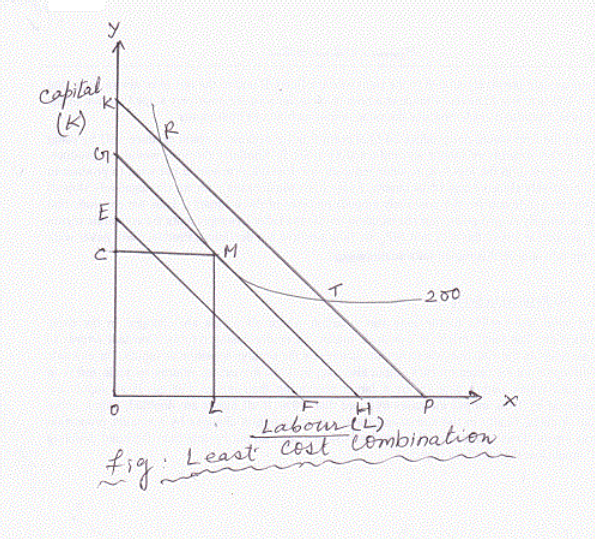
Cost minimization for a given output:-

In the theory of production the profit maximization firm will choose that combination which minimizes its cost of production for giver output. This well be the optimal combination for it.

Assumptions:-

1. There are two factors, labour and capital.
2. All units of labour and capital are homogeneous.
3. The prices of units of labour (W) and that of capital (r) are given and constant
4. The cost outlay is given
5. The firm produces a single product
6. The product is given and constant
7. The firm aims at profit maximization
8. There is perfect competition in the factor market.

Given these assumptions, the point of least cost combination of factors for a given level of output is where the isoquant curve is tangent to an iso cost line.



In figure the iso cost line GH is tangent to the isoquant (200) at point M. The firm employs the combination of OC of capital and OL of labour to produce 200 units of output at output at point M with the given cost outlay GH. At this point the firm is minimizing its cost for producing 200 units. Any other combination on the isoquant 200 such as R or T is on the higher iso cost line KP which shows higher cost of production. The iso cost line EG shows lower cost but output 200 cannot be attained with it. There the firm will choose the minimum cost point M, which is the least cost factor combination for producing 200 units of output M is thus the optional combination for the firm. This can be written as :-

$$\frac{W}{R} = \frac{MP_L}{MP_k} = MRTS_{LK}$$

i.e The slope of the iso quant curve is equal to the marginal rate of technical substitution of labour and capital ($MRTS_{LK}$), which in turn equal to the ratio of the MP of L and MP of K.

CHAPTER-VI

DIFFERENT MARKET STRUCTURE

Objective type Question:

Q.1. Which of the following formulae is used to know average revenue?
(a) MR/Q (b) TR/Q
(c) △TR/△Q (d) MR*Q
Correct Answer (b)

Q.2. Marginal revenue can be
(a) Positive (b) Negative
(c) Zero (d) All of the above
Correct Answer (d)

Q.3. Who determines price under perfect competition
(a) Firm (b) Industry
(c) Customer (d) Government
Correct Answer (b)

Q.4. What can a monopolist get in the long period?
(a) Normal Profit (b) Super normal profit
(c) Loss (d) All the three
Correct Answer (b)

Q.5. Consumers are likely to get a variety of goods under
(a) Monopoly (b) Perfect competition
(c) Oligopoly (d) Monopolistic competition
Correct Answer (d)

Q.6. The Economics of Imperfect competition is associated with
(a) Marshall (b) J. Robinson
(c) Ricardo (d) J.M. Keynes

Correct Answer (b)

Q.7. The LAC curve falls as output expands. This is due to :-

(a) Economies of scale (b) The law of diminishing returns

(c) Diseconomies of scale (d) None of the above

Correct Answer (a)

Q.8. All of the following curves are U shaped excepts :-

(a) The AVC curve (b) The AFC curve

(c) The AC curve (d) The MC curve

Correct Answer (b)

Q.9. At the optimum level of output for the pure monopolist:-

(a) MR=SMC (b) P= SMC

(c) P=lowest SAC (d) P is highest

Correct Answer (a)

Long Answer type Question

Q.1. Point out the difference between a firm and industry. Discuss the equilibrium of a firm in short run and long run under perfect competition

Ans. A firm is in equilibrium when it has no tendency to change its level of output. It needs neither expansion nor contraction. It is earning maximum profits in equilibrium by equating its marginal cost with its marginal revenue. Diagrammatically the conditions of equilibrium of the firm are –(i) the MC curve must equal the MR curve. This is the order and necessary condition. But this is not a sufficient condition which may be fulfilled yet the form may not be in equilibrium (2) The MC curve must cut the MR curve from below and after the point of equilibrium it must be above the MR. This is 2nd order condition. An industry is in equilibrium, firstly when there is no tendency for the firms rather to leave or enter the industry and secondly when each firm is also in equilibrium. The 1st condition implies that the AC curve coincide with the AR curves of all the firms in industry. An industry is a group of all firms. They are earning only normal profits, which are supposed to be included in the AC curves of the firms. The 2nd condition implies the equality of MC and MR. Under a perfectly competitive industry these two conditions must be satisfied at the point of equilibrium, i ,e MR=MC, AC=AR, : AR=MR : MC=AC=AR such a situation represents full equilibrium of the industry.

Equilibrium under perfect competition

Perfect competition refers to the type of market organization in which (1) there are many buyers and sellers of a commodity, each too small to affect the price of the commodity. (2) the commodity is homogeneous (identical) (3) there is perfectly mobility of resources and (4) economic agents have perfect knowledge of market condition (i.e. prices and cost)

Price Determination in the Market Period

The market period or the very short run refers to the time period during which no input can be varied (i.e. all costs are fixed) and so the market supply of a commodity is also fixed. The market period may be a day a week a month or longer depending on the industry.

During the market period costs of production are irrelevant in the determination of price and the entire stock of a perishable commodity is put up for sale at whatever price it can fetch. Thus with perfect competition among buyers and sellers demand alone determines price while supply alone determines quantity.

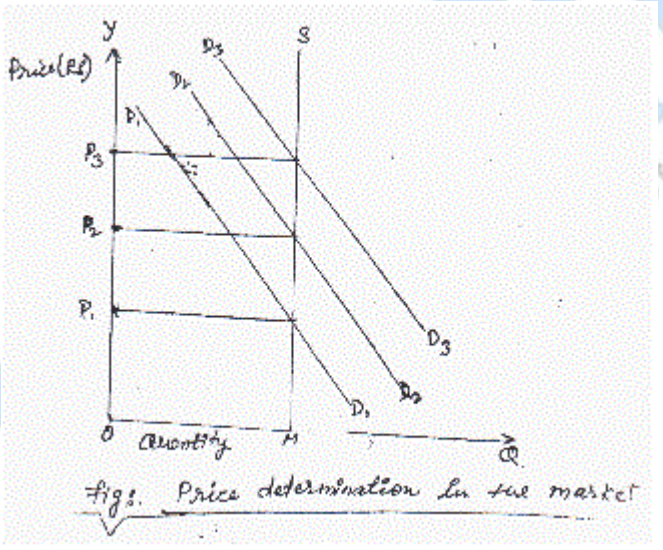


Fig: Price determination in the market

In fig with the quantity supplies fixed at OM the market supply curve of the commodity is SM with D_2 as the market demand curve the equilibrium price is P_2. At higher price than P_2 there will be unsold quantities and this will cause the price to fall to the equilibrium level. At price below P_2 the quantity demanded exceeds the quantity supplied and the price will bid up to P_2. With D_3 as the demand curve $P=P_3$. With D_1 as the demand

curve, $P=P_1$. Intersection of demand and supply curves are equilibrium points respectively E_2, E_3 & E_1

Short Run Equilibrium of the firm

Total Approach:-Maximizing the positive difference between total revenue and total costs.

The equilibrium output of the firm is the output that maximizes the total profits of the firm. Total profits equal total revenue minus total costs . Thus total profits are maximized where the positive difference between total revenue and total cost is largest.

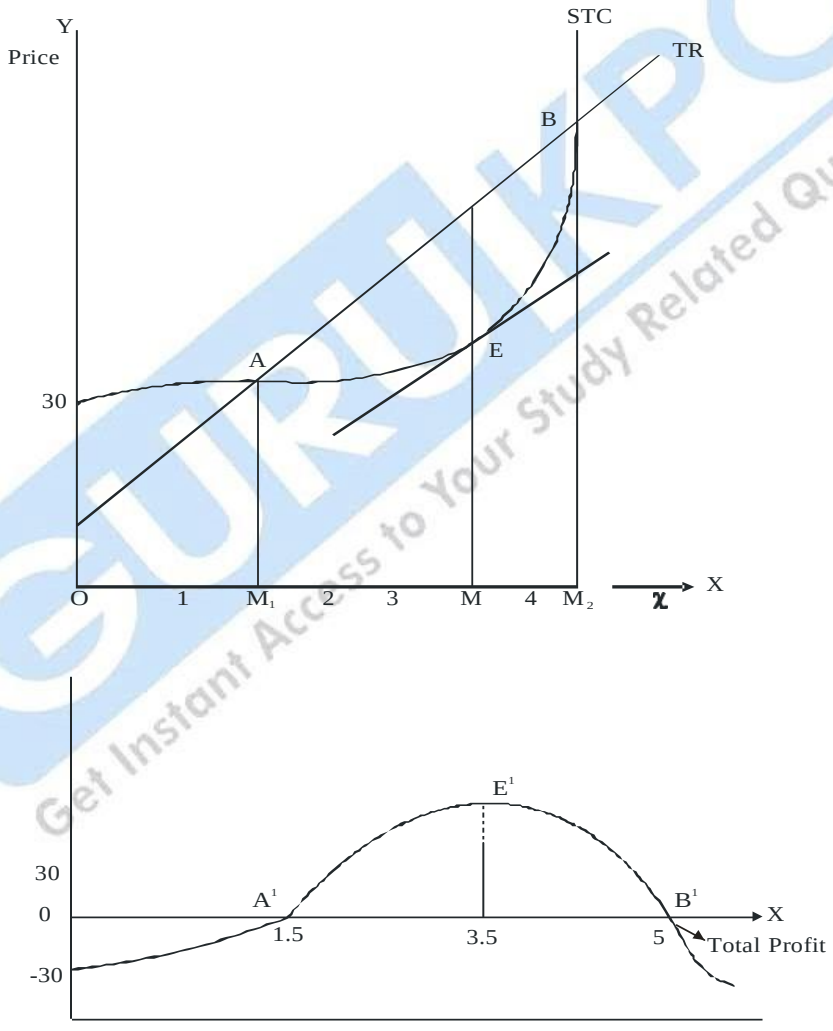


Fig. Short Run Equilibrium of the firm
(Total Approach)

In fig. The TR curve is a straigth line through the origin with slope of P=Rs.35 At Q=0, TR=0 and STC =Rs 30, so that total profits are –Rs 30 and equal the firm‟s TFC (at bottom panel) At Q=1, TR=Rs 35 and STC= Rs. 50 so that total profits are Rs 15. At Q=1.5, TR= STC=Rs.52.50 so and the total profits are zero. This is breakeven point.

Between Q=1.5 and Q=5, TR exceeds STC and the firm earns (Positive) economic profits. Total profits are greatest at Rs. 31.50 when Q=3.5 (and the TR and the STC curves are paralled) At Q=5, TR=STC= Rs. 175 so that total profits are Zero (point B & B^1) At greater than 5. TR is smaller than STC and the firm incurs a loss.

Total revenue, Total cost and Total Profit

Qty Out Put	Price Rs.	Total Revenue	Total Cost	Total Profit
0	35	0	30	-30
1	35	35	50	-15
2	35	70	70	0
3	35	105	60	40
4	35	140	80	60
5	35	165	100	+65
6	35	210	210	0
7	35	245	265	-20

Marginal Approach: Equating marginal Revenue & Marginal cost

Although the total approach to determine the equilibrium output of the firm is useful the marginal approach is even more valuable & more widely used.

Profit Maximization or loss minimization

The best or optimum levels of output of the firm is at the point where P (or MR) equals MC and MC is rising At this level of output however the firm can either make a profit, break even or incur a loss.

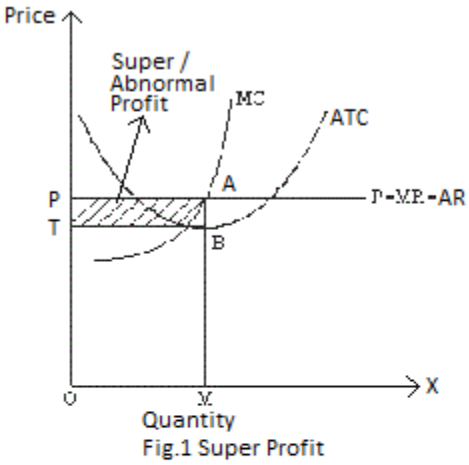


Fig.1 Super Profit

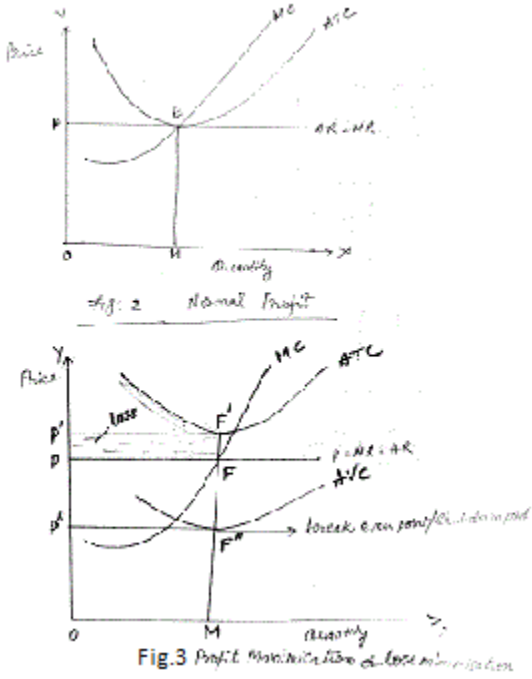


Fig.3 Profit

In fig (1) equilibrium level of output =OM equilibrium price = OP. At this price level AC<AR firm incurs profit = PTAB

In fig (2) Equilibrium level of output =OM at this level price=OP, here AR=AC : from incurs no loss no profit or normal profit. In fig (3) Equilibrium level of output=OM, here price= op and AC>AR so firm gets loss= APTB In fig (4) firm"s breakeven point= F"" where firm get AVC After this point firm will switch over from the market.

Cost in the long Run

In the long run all inputs and costs are variable i.e. there are no fixed inputs and no fixed costs.

Long Run Equilibrium of the Firm:

In the long run all inputs are variable and the firm can build the most efficient plant to produce the best or most profitable level of output. The best (i.e. the profit maximizing) level of output of the firm in the long run is the one at which price or marginal revenue equals long run marginal cost. The most efficient plant is the one that allows the firm to produce the best level of output at the lowest possible cost. This is the plant represented

by the SATC5 curve tangent to the LAC curve of the firm at the best level of output as shown in fig (5).

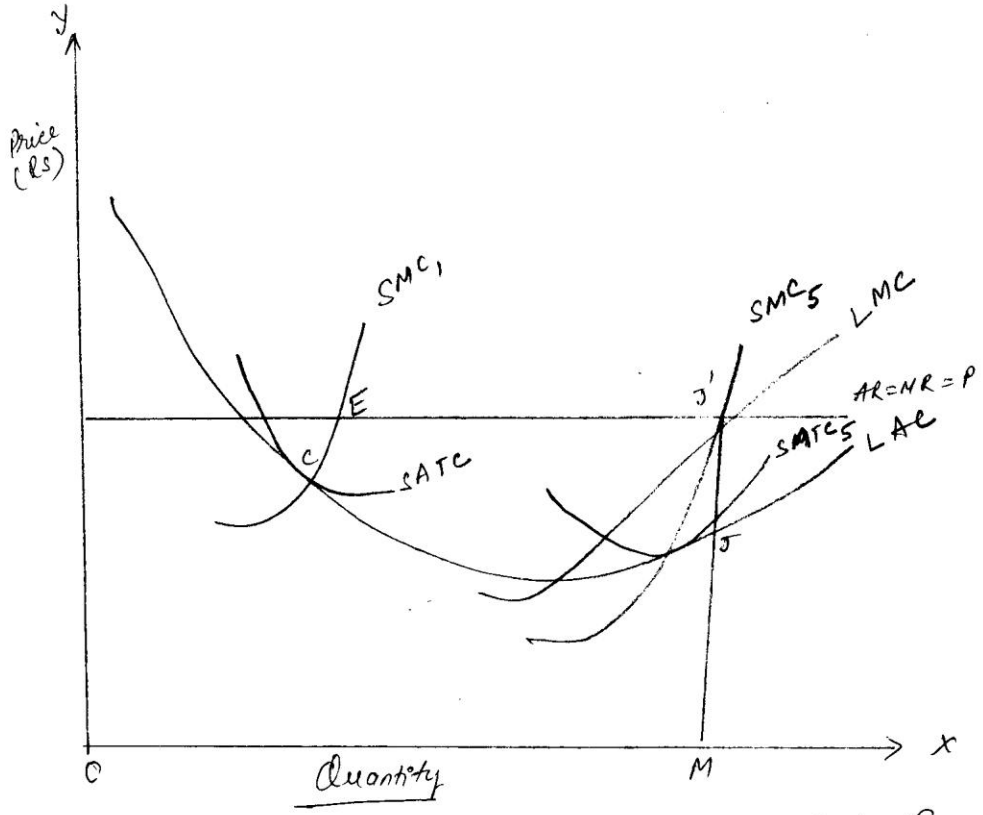


fig (5) : Long Run Equilibrium of the Firm

In fig (5) long run equilibrium of the firm is at P=MR the firm is in short run equilibrium at point E. In the long run the firm will make profits of J^1J per unit since at point J^1, P=MR=SMC=LMC, the firm is also in short run equilibrium.

Long run equilibrium of the industry & firm :-

Even though the firm would be in the long run equilibrium of point J^1 in fig (5) the industry would not. This is because the large profits that this and other firms earn at point J; will attract more firms to the industry. As new firms enter the industry (entry is free and resources are mobile), aggregate output expands. This will shift the short run industry supply curve to the right until it inter-sects the market demand curve at the commodity

price at which all firm make zero economic profit (i.e. they earn only a normal return) in the long run. Then and only then, will the industry (and the firm) be in equilibrium. In fact, the building of the best plant by the firm and the entrance of new firm into the industry will take place simultaneously in the LR (long run) the final result (equilibrium) is shown in fig(6).

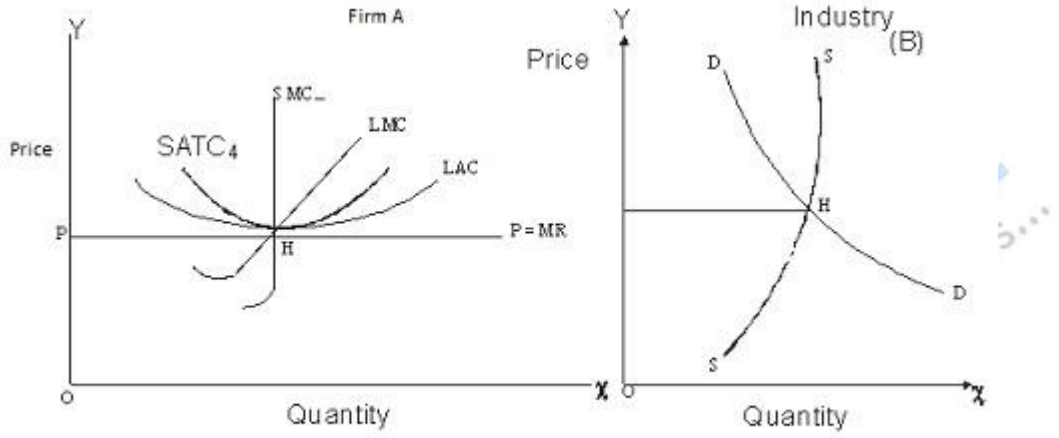


Fig :6 Long Run Equilibrium of firm & industry

Fig :6 Long Run Equilibrium of firm & industry

In fig, The industry (B) and the firm (A) are in the LR equilibrium at point H, where P=MR=SMC=LMC=SATC=LAC. The firm produces at the lowest point on its LAC curve (operating optimal plant $SATC_4$ at point H) and earns zero profits. That is the owner receives a return on the capital invested in the firm equal only to the amount that he or she would earn by investing the capital in a similarly risk venture. These zero profits in economics mean that the total revenues of the firm just cover all costs (explicit & Implicit).

Q.2 How are the price and output determined under monopoly in the short run and long run. Is monopoly price always higher than competitive price?

Ans. **Definition and Sources of monopoly:-** Pure monopoly is the form of market organization in which a single firm sells a commodity for which there are no close substitutes. Thus the monopolist represents the industry and faces the industry"s negatively sloped demand curve for the commodity. As opposed to a perfectly competitive firm a monopolist can earn profits in the long run because entry into the industry is blocked or very difficult. Monopoly is at the opposite extreme from perfect

competition in the spectrum or range of market organization. When as the perfect competitor is a price taker and has no control over the price of the commodity it sells, the monopolist has complete control over prices. The monopolist‟s ability to control or affect price is evidence of its monopoly power. Monopoly can arise from several causes 1st, a firm may own or control the entire supply of a raw material required in the production of a commodity or the firm may possess some unique managerial required in the production of a commodity, or the firm may possess some managerial talent. 2nd a firm may own a patent for the exclusive right to produce a commodity or to use particular production process. 3rd economies of scale may operate (i.e. the LR, AC cost curve may fall) over a sufficiently large range of outputs. So as to leave a single firm supplying the entire such a firm is called a natural monopoly. Examples of natural monopolies are electricity, water, gas and transportation companies. 4th some monopolies are created by govt. franchise itself. For examples licenses are often required by local governments to start a radio or television station, to open a liquor store, to operate a taxi, to be plumber, a barber, funeral director, and so on. The purpose of these licenses is to insure minimum standards of competency. A monopolist does not have market power, however, but faces many forms of direct & indirect competition. On a general level a monopolist competes with the sellers of all other commodities in the market. Furthermore while close substitutes do not exist for the particular commodity supplied by the monopolist, imperfect substitutes are likely to exist, in addition the market power of the monopolist (or would be monopolist) is sharply curtailed by fear of government antitrust prosecution by the threats of potential competitors and by international competition.

Short Run Equilibrium (Price and Output):

(i) Total Approach:- Maximizing the positive difference unlike the case of a perfectly competitive firm the monopolist‟s TR curve is not a straight line but, has the shape of an inverted U. The reason is that the monopolist must lower the price to sell additional units of a commodity. The monopolists STC faces upward or increases at an increasing rate past Q=2 because of diminishing returns.

Table TR & SR, TC & Total Profits

Qty	Price Rs.	Total Revenue	Total Cost	Total Profit
0	9	0	6	-6
1	8	8	10	-2
2	7	14	12	2
3	6	18	13	5
4	5	20	19	1
5	4	20	30	-10
6	3	18	48	-30

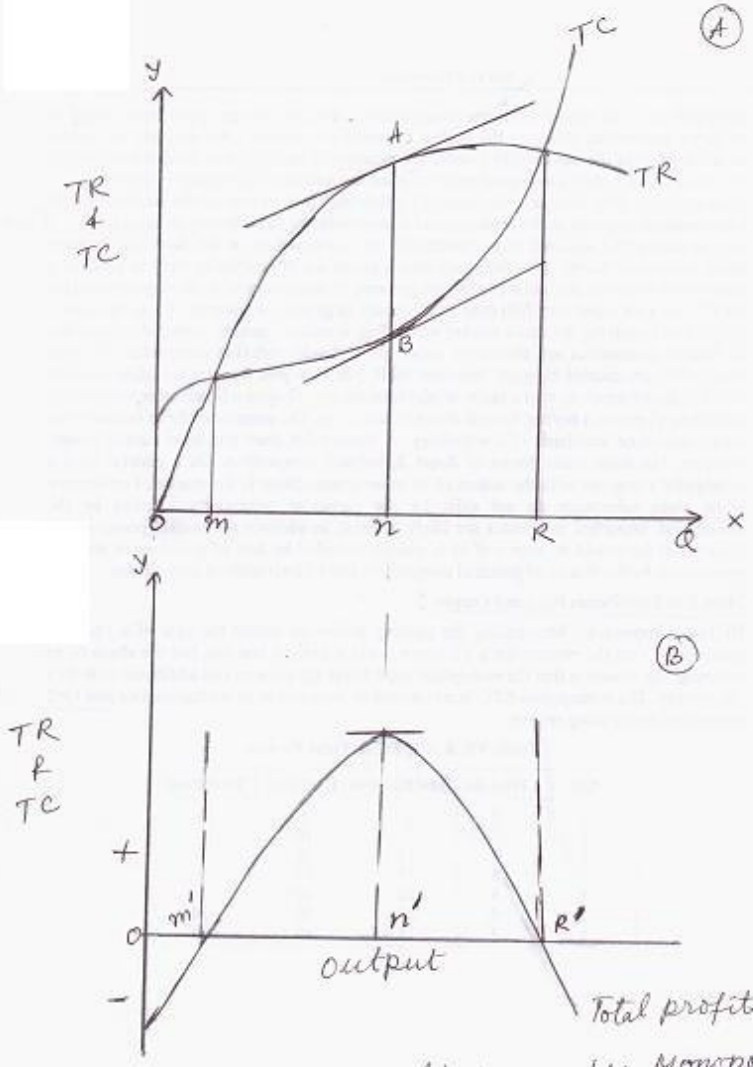


fig: Short Run equilibrium of the Monopolist: (Total Approach)

In fig. The monopolist TR curve has the shape of an inverted U because the monopolist must lower the commodity price to sell additional units. The STC has the usual shape. Total profits are maximized at N where the positive difference between TR & STC is greatest (AB). This is the point where the TR & the STC curves are parallel (A) and the total profit curve is highest (B). Total profits are positive between M^1R^1 and negative at other output levels. At Q=O total loss is OS=TFC.

Q.3. Describe Price & Output determination under discriminating monopoly.

Ans. A market in which there is a single seller or producer of a commodity and he charges different prices from different customers for his product is called discriminating monopoly. For eg RSEB charges different price for the domestic consumption and commercial uses of electricity is discriminatory monopoly or price discrimination.

According to Mr. R.S. Joan Robinson : "The act of selling the same article produced under single control at different prices to different buyers, is known as price discrimination."

Preconditions for price Discrimination

1. Single seller or producer of a commodity
2. Two separate markets
3. Different Elasticity of Demand.
4. Nature of the product
5. Laziness or Ignorance of Buyers
6. Supply or sale on order
7. Legal Acceptance
8. Varying preference and habits of consumers.
9. Different users.
10. Tariff charges
11. Different Transport charges
12. Busy and Slack working hours

Types of price Discrimination

1. Personal price discrimination
2. Geographical price discrimination
3. Price Discrimination According to use.
4. Price Discrimination According to the age sex or status of the consumer
5. Price Discrimination According to time
6. Price Discrimination According to the nature of product
7. Price discrimination According to category of consumers
8. Price discrimination on the basis of discounts
   (a) Distributors Discount
   (b) Cash discount
   (c) Quantity discount

Price & Output Determination Under Discriminating Monopoly:-

A discriminating monopolist also aims maximization of profit, he determines price and output of his product in such a way that he attains maximization of his profit. The point of equilibrium under discriminating monopoly will be at a point where its aggregate marginal cost is equal to aggregate marginal revenue (A MC= AMR). He will fit different prices in different markets for the same product or service. Price & output determination under discriminating monopoly has two situations as given below

(1) A monopoly market structure in both the markets

(2) A monopoly market structure in domestic market and competitive position in foreign market.

1. Monopoly Position in Both the Markets

A monopoly firm has to take several decisions in both the markets as given below.

(1) Total production of a commodity

(2) Volume of production to be shared in both the markets and.

(3) Price in both the markets.

Keeping in view all these three things price and Output determination under discriminating monopoly can be explained with the followings diagram.

This diagram consists of market A, market B and combined A&B. This corresponding AR & MR. The combined Markets (A&B) with aggregate average revenue curve $\sum AR$ and aggregate marginal revenue curve $\sum MR$.

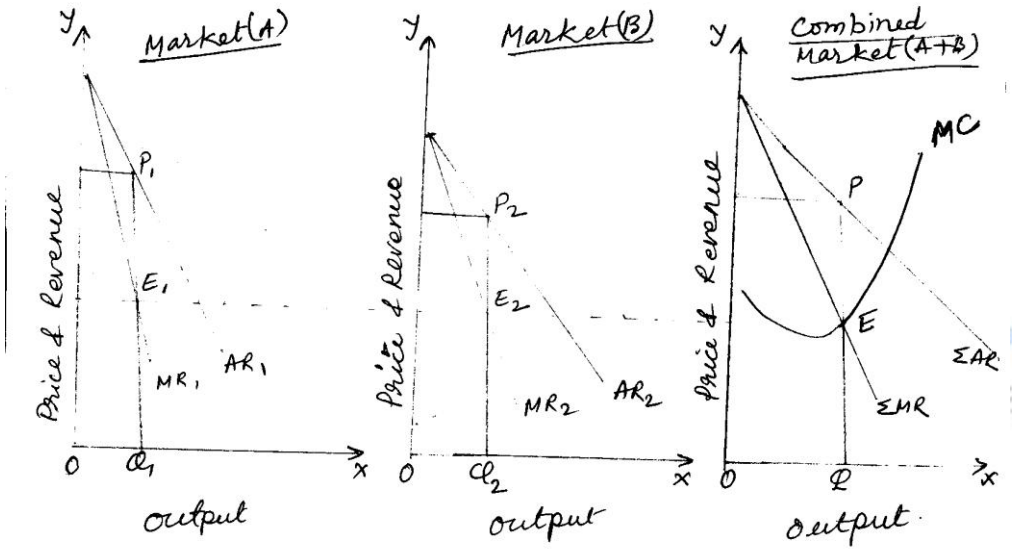
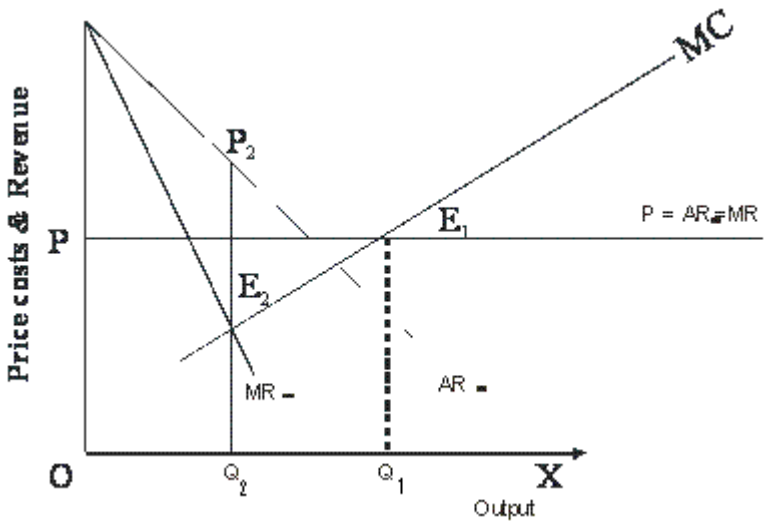


Fig: Price Discrimination Under Monopoly.

This point of equilibrium is at point, Ɛ where the MC cuts the ƐMR. The output is OQ and the price is PQ in the combined market. We will draw a parallel line to ox. axis of A & Market B from E point of aggregate market. The points of equiliburm in market A, will be at E_1 where MC=MR_1 price in this market is OP_1 and output=OQ_1 In the market B the point of equilibrant is E_2 where the MC=MR_2. Here the price is P_2Q_2 and output is OQ_2. The price in both markets is different due to different elasticities of markets demands.

2. **Monopoly in domestic market and competition in foreign market or dumping.** The monopoly firm charges high price in domestic market because in this market the e of d for product is inelastic with in foreign market the demand is elastic so the price will be kept at low level. This can be shown by fig(2).

   In fig . AR_1&MR_1= AR&MR curves of foreign market while AR_2 & MR_2=AR&MR curves in monopoly (domestic) market. Price =where MC=MR in both the markets E_1=point of equilibrium of the firm in foreign market.



Output = OQ_1 Price = OP

In domestic market price = P_2Q_2

Output = OQ_2 (which is less than foreign market)

CHAPTER-VII

RENT

Objective Type Question

Q.1. The concept of transfer earning is associated with:-
(a) Theory of monopolistic competition
(b) The theory of interest
(c) The modern theory of rent
(d) The theory of profit
Correct Answer (c)

Q.2. Quasi-Rent is equal to
(a) P-AVC (b) P-AFC
(c) P-AC (d) P-MC
Correct Answer (a)

Q.3. "Rent is a differential surplus" This idea was propounded by:-
(a)David Ricardo (b) Alfred Marshall
(c) Mrs. Joan Robinson (d) K.E. Boulding
Correct Answer (b)

Q.4. According to Ricardo Marginal land is that land which gives.
(a) Rent (b) Less Rent
(c) More Rent (d) No Rent
Correct Answer (d)

Q.5. First of all the term „Quasi Rent „ was used by:-
(a) Ricardo (b) Marshall
(c) Clark (d) Keynes
Correct Answer (b)

Long Answer type questions

Q.1. Discuss the modern theory of rent. Is it an improvement over Ricardian theory of rent.

Ans. **Definition of Rent:-Classical definition** According to David Recardo :- Rent is that part of produce of the land which is paid to the land-lord for the use of the original and indestructible powers of the soil.

Modern definition

Mrs. Joan Robinson has defined "The essence of the conception of the rent is the conception of a surplus earned by a particular part of a factor of production over and above the minimum earning necessary to include it to do its work".

Modern Theory of Rent

Recardian theory of rent has been criticized by modern economists and they have propounded the modern theory of rent. According to this theory rent not only arises in case of land but other factors of production namely labour, capital, entrepreneur and organization may get rent during short period because their supply cannot be adjusted to their demand. The scarcity element is found in each factor of production. Thus we can say that there is rent element in all the factor of production.

Basis of the Theory

The basis of modern theory of rent is that the factor of production can be categorized into two as given below.

(i) Specific factors of production.

(ii) Non specific factors of production

Specific factors of production are those which are used in specific purposes or uses only and they do not have business mobility.

Non-specific factors of production:-are those which can be put to various uses. The rent according to this theory can be calculated on the basis of this formula. Rent= Actual Earning-Transfer Earning

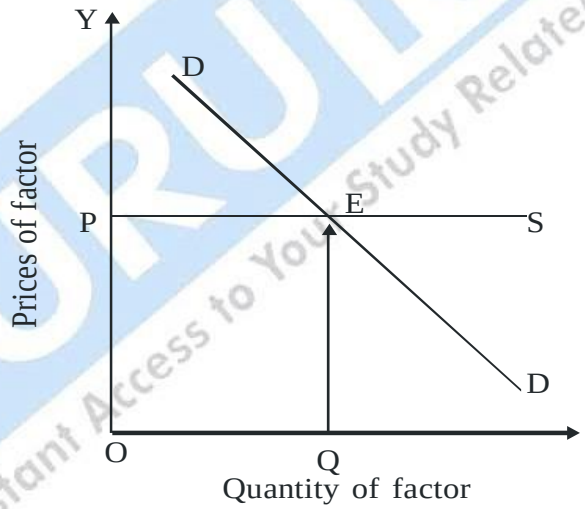
Thus the income of any factor of production consists of transfer earning and economic rent. Transfer earning is a check on the transfer of a factor from one use to another. Economic rent is the surplus over the total actual earning & transfer earning. The higher the difference between actual earning & transfer earning of a factor of production higher will be the rent of that factor of production. Modern theory of rent can be explained with the help of the following example.

Actual Earning	Transfer Earning or Opportunity Cost	Rent = Aetual Earning - Transfer Earning
Rs. 4,000	Rs. 4,000	4,000 - 4,000 = 0
Rs. 4,000	Rs. 0,000	4000 - 0000 = 4000
Rs. 4,000	Rs. 3,000	4000 - 30000 = 1000
Rs. 4,000	Rs. 5,000	Rs. 1000 The factor will leave the industry and earn Rs. 5000 which is Transfer earning and it is surplus over the actual earning

Explanation with the help of diagram.

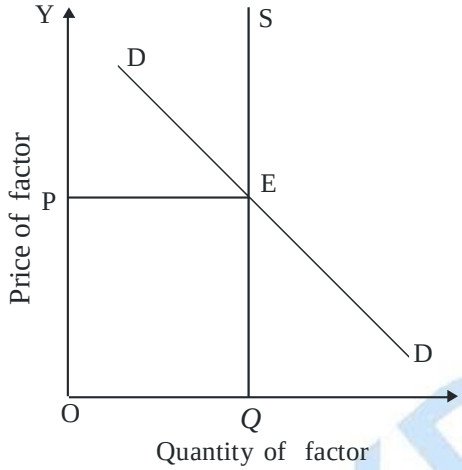
Explanation

(1) Perfectly elastic supply of a factor and zero rent



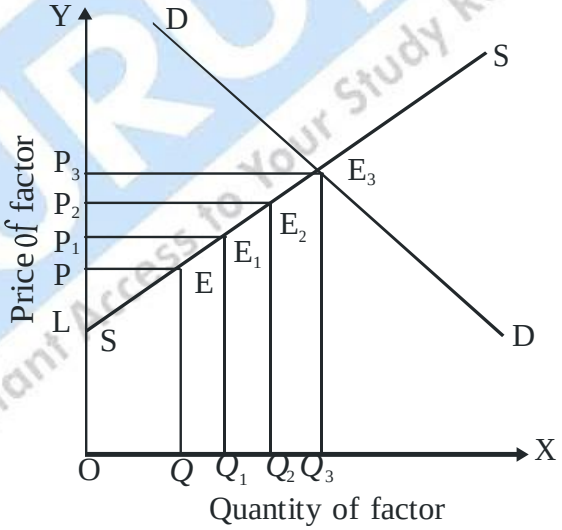
In fig DD= demand curve for the factor, PS= supply of factor, Equilibrium = at point E. The amount paid to the factor =OQEP. The transfer earning of the factor is also OQEP. Hence there is no rent (zero rent) on that factor.

(2) supply of a factor is perfectly inelastic and rent



In fig perfectly inelastic supply curve= S, Equilibrium at E quantity of factor =OQ price = OP The total payment is OPEQ and this payment is rent.

(3) Less than perfectly elastic supply & rent



In fig (3)DD= demand for factor SS= supply of factor Rent = Actual earning of the factor (-) transfer earning of the factor =$OQ_3 E_3 P_3$ - $OQ_3 E_3 L$= $LE_3 P_3$

Thus according to the modern theory of rent each factor of production land labour capital enterprises and organization can get the rent because the essential condition for the

payment of rent is that the supply of a factor should be less than perfectly elastic or in elastic. It will be possible when the factors of production has the element of specific.

Q.2. Write short note on Quasi Rent:-

Ans. The doctrine of quasi rent was introduced into economic literature by Marshall who extended Ricardo"s theory of land rent to other factors fixed in supply during the short period. When the demand for durable factors (machines ships, houses and even human ability) increases, their supply being fixed they earn a surplus which is not rent but is like rent as their supply can be increased in the long run. Marshall preferred to call it explains the emergence of quasi rent.

Its Determination

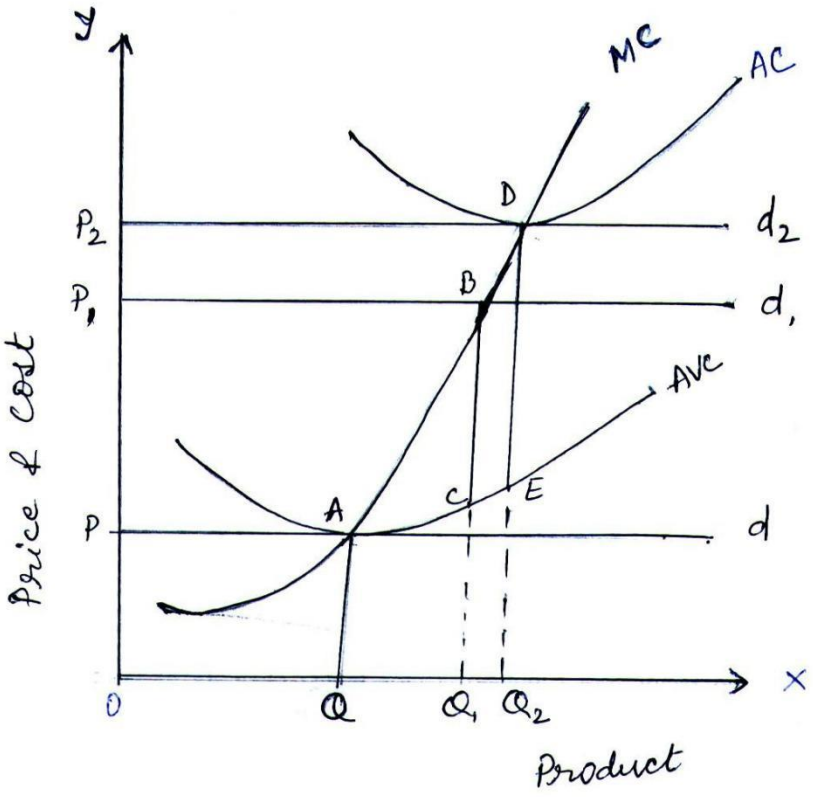


Fig: Quasi Rent

In the short run a firm under perfect competition must cover its price or variable costs. These are expenses on wages, raw materials and on other variable inputs incurred to work the fixed factors like machines. The firm can continue to produce the product so long it covers these prime costs of production and even none of its supplementary costs (in the hope of recovering both in the long period). If however the sort period price of the commodity rises due to an increased demand the firm will be recovering a part of its supplementary costs. These supplementary costs are the source of quasi rent. For whatever surplus the firm earns above its prime costs is quasi rent proper. In the long run, all costs are prime cost and they must be covered otherwise the firm will cease to exist. Since there are no supplementary costs in LR and Quasi rent is a return on them by hypothesis therefore quasi rent does not arise in LR. According to figure AVC= average or prime cost curve, AC= Average total cost curve MC= marginal cost to these curves, pd,p_1d_1, p_2d_2 and AR =MR curves. At op price the firm covers its AVC=AQ by producing product=OQ If the price rise above op to op_1 or op_2 price Quasi rent per unit emerges At op price per unit rent =CB and product = OQ_1 at OP_2 price quasi rent per unit=ED

In the LR if the price is above OP_2 the entry of firms will eliminate quasi rent, a price below OP_2 will also wipe it out by the exit of firms and ultimately OP_2 price must prevail.

CHAPTER-VIII

INTEREST

Objective Type Questions:-

Q.1. Who wrote the „General Theory of Employment Interest and money"
(a) Ragner nurkse (b) Alfred Marshall
(c) J.R. Hicks (d) J.M. Keynes
Correct Answer (d)

Q.2. The demand for money for speculative motive depends chiefly on current level of:-
(a) Incomes (b) Price
(c) Wages (d) Rate of interest
Correct Answer (d)

Q.3. In monetary rate of interest is 10% and rate of inflation is 8% then real rate of interest well be:-
(a) -2% (b) 2%
(c) 1.25% (d) 10%
Correct Answer (b)

Q.4. The loanable funds theory of interest was propounded by:-
(a) Ragner Nurkse (b) Neo- classical economists
(c) J.R. Hicks (d) J.M. Keynes
Correct Answer (b)

Q.5. Monetary theory of interest is:-
(a) Loanable fund theory (b) Classical theory
(c) Keynes liquidity (d) Preference theory
Correct Answer (c)

Q.6. The supply of loanable funds depend on :-
(a) Saving +Bank Credit

(b) Saving +Bank credit +Disinvestment +dishoarding
(c) Investment +Hoarding
(d) Bank Credit +hoarding
Correct Answer (b)

Long Answer type question

Q.1. "Interest is purely a monetary phenomenon" Explain the statement in the contest of liquidity preference theory of interest. Or Critically examine the liquidity preference theory of interest.

Ans. In common parlance interest is a payment made by a borrower to the lender for the money borrowed and is expressed as a percent per year. In economic interest has been defined in a variety of ways. Commonly interest is regarded as the payment of the use or service of capital. In other words interest is simultaneously the reward for the pure yield of capital of saving for the forgoing of liquidity and supply of money.

Keynes' Liquidity Preference Theory of Interest

Keynes defines the rate of interest as the reward of not boarding but the reward for parting with liquidity for the specified period. It is not the price which brings into equilibrium the demand for resources to invest with readiness to abstain from consumption. It is the „price", which equilibrates the desire to hold wealth in the form of cash with the available quantity of cash. This theory is therefore characterized as the monetary theory of interest as distinct from the real theory of classical.

-**Supply of Money**:-

Of the two determinants of the interest the supply of money refers to the total quantity of money in the country for all purposes at any time. Though the supply of money is a function of the rate of interest to a degree, yet it is considered to be fixed by the monetary authorities, i.e. the supply curve of money is taken as perfectly inelastic.

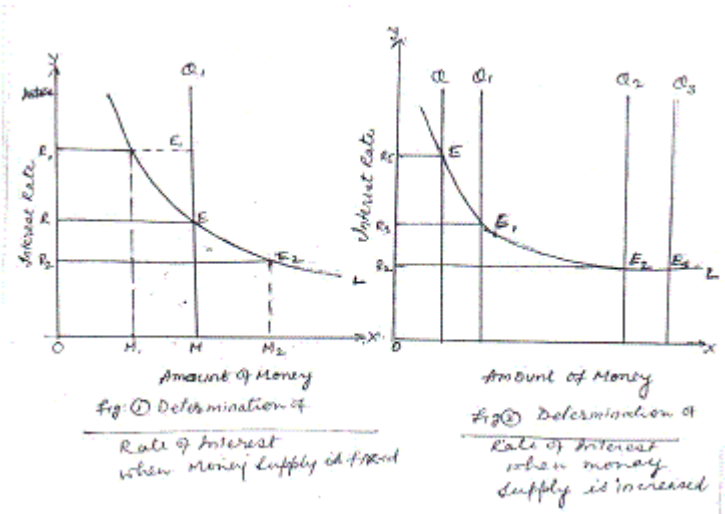
Demand For Money:-

According to Keynes there are three motives behind the desire of the people to hold liquid cash (1) the transaction motive (2) the pre-cautionary motive and (3) the speculative motive

1. Transaction motive:-It relates to the need of cash for the current transaction of personal and business exchanges. It is further divided into the income and business motives There will, however be changes in the transactions demand for money depending upon the expectation of the income recipients and businessmen. They depend upon the level of income employment and prices, the business turnover, the normal period between the receipt and disbursement of income, the amount of salary or income and on the possibility of getting a loan.

2. **Precautionary Motive:**-It relates to the desire to provide for contingencies requiring sudden expenditures and for unforeseen opportunities of advantageous purchases. Both individual & businessmen keep cash in reserve to meet unexpected needs. Keynes holds that the transaction and precautionary motives are relatively interest inelastic, but are highly income elastic. The amount of money held under these two motives (M_1)is a function (L_1) of the level of income (Y) and is expressed as (M_1) $=L_1(Y)$
3. **Speculative motive:-** Money held for speculative purpose is a liquid store of value which can be invested at an opportune moment in interest biasing bonds or securities. According to Keynes it is (speculative demand for money) is a decreasing function of the rate of interest. The higher the rate of interest, the lower the speculative demand for money and the lower the rate of interest, the higher the speculative demand for money. Algebraically, Keynes expressed the speculative demand for money as $M_2=L_2(r)$ where L_2 is the speculative demand for money and r is the rate of interest. Geometrically, it is a smooth curve which slopes downward from left to right. But at a very low rate of interest, such as 2% the speculative demand for money becomes perfectly elastic. This portion of the curve is known as the liquidity trap. At a very low rate of interest people prefer to keep money in cash rather than invest in bonds because purchasing bonds will mean a definite loss. If the total liquid money is denoted by M_1 the transaction plus precautionary motives by M_1 and the speculative motive for holding by M_2 then $M=M_1+M_2$ since $M_1=L_1$, (Y) and $M_2=L_2(r)$, the total liquidity preference function is expressed as $M_1=L(y, r)$ is Circulating or active money and M_2 is idle or passive money.

   Determination of the Rate of Interest The rate of interest, like the price of any product or service is determined at a level where the demand for money equals the available supply of money.



In fig(1) the vertical line Q_1 M represents the supply of money and L the total demand for money curve. Both intersect at E, where the equilibrium rate of interest OR is established. If there is any deviation from this equilibrium position, an adjustment well take place via the rate of interest and the equilibrium level E is re-established. If the supply of money is increased by the monetary authorities, but the liquidity preference curve L remains the same the rate of interest will fall. This is illustrated in fig(2) Given the L curve , the supply of money curve being QM the rate of interest is OR_5 with the increase in the supply of money from QM to QM_1 and Q_2M_2 the rate of interest falls from OR_5 to OR_3 to OR_2. But any further increase in the supply of money has no effect on the rate of interest because the liquidity preference curve L is perfectly elastic at OR_2 rate of interest. If the demand for money increases and the liquidity preference curve shifts upward, given the supply of money, the rate of interest rises. This is shown in fig (3). Given the supply of money curve QM, when the L curve shifts upward, the new equilibrium point is E which determines OR_6 interest rate. This rate of interest is higher than OR_4 interest rate at the equilibrium point E.

If with the increase in the liquidity preference, the supply of money also increases in the same proportion to Q_1M_1 there well be no change in the rate of interest OR_4 except that the new equilibrium point is E_2. Thus the theory explains that the rate of interest is determined at a point where the liquidity preference curve equals the supply of money curve.

Criticism :-This theory; has been severely criticized by harrow, Robertson, Knight, Hutt & others on the following grounds:-

(1) college bursar‟s theory.

(2) Inadequate and misleading.

(3) Methodological fallacy.

(4) Money as stone of wealth is not barren.

(5) In consistent theory.

(6) Saving essential for liquidity.

(7) Liquidity not essential for interest rate.

(8) Notion of liquidity trap wrong.

(9) Ignores the influence of real factors.

(10) In complete theory.

(11) Confusion regarding relation between interest rate and quantity of money.

CHAPTER IX

PROFIT

Objective type Questions :-

Q.1. which of the following is the equation of net profit:-
(a) Total Revenue – Explicit cost
(b) Total Revenue – Implicit cost
(c) Total Revenue - Total cost
(d) None of the above
Correct Answer (c)

Q.2. Innovation Theory of Profit was propounded by :-
(a)Clark (b) Knight
(c)Schumpeter (d) Hawley
Correct Answer (c)

Q.3. The uncertainty bearing theory of profits was propounded by:-
(a)Knight (b) Hawley
(c)Schumpeter (d) Clark
Correct Answer (a)

Q.4. Risk theory of profit was propounded by :-
(a)J.B. Clark (b) J.M. Keynes
(c)A. Marshall (d) Hawley
Correct Answer (d)

Long Answer type question

Q.1. Review critically the following statements:-
(i) Profit is the reward for risk
(ii) Profit is the reward for uncertainty – bearing

Ans. **The Risk Theory** The risk theory of profit is associated with F.B. Hawley who regards risk taking as the main function of the entrepreneurs. Profit is the residual

income which the entrepreneur receives because he assumes risk. No entrepreneur will be willing to undertake risk if he gets only the normal return. Therefore the reward for risk taking must be higher than the actual value of the risk.

According to Hawley the entrepreneur can avoid certain risk for a fixed payment to the insurance company. But he cannot get rid of all risk by means of insurance for if he is able to do so he would cease to be an entrepreneur and would earn only wages of management and no profit. However, when the entrepreneur transfers his risk to the insurance company he abdicates his risk taking function to the latter which receives the profit. The reward of the insurance company is not the premium it receives but the difference between that premium and the loss it eventually suffers. So profit is the reward if risk taking, especially of "wisely selected" risks. But all persons are incapable of undertaking risks, so risks act as a deterrent to the supply of entrepreneurs. Those who remain in business are able to earn an excess of payment above the actuarial value of the risk and thus earn profits.

Its Criticism

The risk theory of profit has also been criticized for the following reasons.

1. **Meaning of risk unclear** :- Prof. Hawley does not clarify the meaning of risk, according to Prof. Knight profit accrues to the entrepreneur and not to the insurer. It is only the uninsurable risks which are uncertain that give rise to profits.

2. **Profits due to the Entrepreneurial Ability** :- Risk taking is not the only entrepreneurial function which leads to the emergence of profit. It is also partly a reward for innovating.

3. **Profits the Reward of Avoiding Risks** :- According to Carver, those entrepreneur who are able to avoid risks earn profits. The more risks are avoided, the larger will be the profits earned by the entrepreneur.

4. **Amount of Profit not Related to Size of Risk** :- The quantum of profit in any way is not related to the size of the risk under taken. If it were so every entrepreneur would involve himself into huge risks in order to earn larger profits.

5. **In complete Theory** :- There is little empirical evidence to prove that entrepreneurs earn more in risky enterprises In a way all enterprises are risky for an element of uncertainty is present in them. Thus Hawley"s risk theory is also an incomplete theory of profit.
6. **The Uncertainty bearing theory** :- Prof. Frank H. knight regards Profits as the reward of bearing non-insurable risks and uncertainties. He distinguishes between

insurable and non-insurable risks. Certain risks are measurable in as much as the probability of their occurrence can be statistically calculated, „ The risk of fire, theft of merchandise and of death by accident are incurable such risks are borne by the insurance company. There are certain unique risks which are incalculable. The probability of occurrence cannot be statistically computed because of the presence of uncertainty in them. Such unforeseen risks relate to changes in prices, demand, supply etc. No insurance company can calculate the loss expected from such risks, and hence they are non-insurable. Profit according to knight, is the reward of bearing non-insurable risks and uncertainties. It is a deviation arising from uncertainty between earning expost and exante. Positive or negative profit simply reflects the entrepreneurs judgment to meet conditions of uncertainty.

Its criticism

Knight"s theory of profit is more realistic than the other theories, because it combines the conceptions of risk of economic change and of the role of business ability. But it has its weaknesses. They are as given below:

1. No clear notion of entrepreneurship
2. No solution to distribution of profit among Holders of Corporations
3. No empirical evidence to measure uncertainty bearing
4. Changes in Population and capital unpredictable
5. Profit not a Residual income
6. Uncertainty bearing not a separate factor of production
7. Does not study monopoly profit.

CHAPTER-X

THEORIES OF DISTRIBUTION

Objective Type Questions:-

Q.1. The marginal productivity theory of distribution was propounded by :-
(a)J.M. Keynes (b) A.L. Sen
(c)J.B. Clark (d) J.R. Hicks
Correct Answer (c)

Q.2. MRP of any factor of production is equal to:-
(a)MPP x MR (b) MPP x P
(b) MPP x AR (d) ARP x MR
Correct Answer (a)

Q.3. When there is perfect competition in both markets MRP is :-
(a)MPP x AR (b) MPP x TR
(c) TP x AR (d) None of these
Correct Answer (a)

Q.4. VMP of any factor of production is equal to :-
(a)MPP x MR (b) MPP x P
(c)MPP x AR (d) ARP x MR
Correct Answer (b)

Q.5. According to the marginal productivity theory the price of the factor is equal to:-
(a) Marginal cost (b) Marginal Revenue
(c) Marginal utility (d) Marginal productivity
Correct Answer (d)

Long Answer type question

Q.1. Critically examine the marginal productivity theory of distribution.
Ans. The term distribution in economics refers to personal distribution and functional distribution of income. Personal distribution relates to the forces governing the

distribution of income and wealth among the various individuals of a country. Functional distribution or „factor share distribution" explains the share of total national income received by each factor of production. Despite these apparent differences between distribution and functional distribution, there is close relation between the two. The personal distribution in a country is ultimately affected by its functional distribution of income.

The Marginal Productivity Theory of Distribution

According to this theory the reward of a factor equals its marginal product. Marginal product also known as marginal physical product is the increment made to the total output by employing an additional unit of a factor keeping all other factors constant. It this increase in output is multiplied by the prevailing price of the product, the result is the marginal value product of that factor (VMP_L). But it is better to measure marginal product of a factor in terms of its marginal revenue product (MRP) which may be defined as the addition made to total revenue resulting from the employment of one more unit of a factor of production, other factors remaining unchanged. As a general rule the marginal revenue productivity of a factor diminishes with the increase in the units of that factor service when in the initial stage the units of a variable factor are employed, keeping the other factors constant, the total revenue product may increase more than proportionately for some time. But sooner or later a time will come when the marginal revenue product will start diminishing and will tend to equal the price of the factor service. This tendency of diminishing MRP follows from the law of variable proportions.A firm operating under perfect competition has to pay the same price (reward) to a unit of the factor which is paid by the industry. In order to have maximum profit it acts on the principle of substitution. The substitution of cheaper factors for the dearer will continue till the marginal revenue productivity of each factor is equal to its price. At this stage the factors of production are employed in their most efficient combination or the least cost combination and the profits of the firm well be maximized. In equilibrium therefore the price of a factor service must equal its marginal revenue productivity.

More over substitution also take place between different units of the same factor service. In the ultimate analysis, however the price of a factor unit is higher than its average revenue productivity, the firms will be incurring losses. As a result some of the firms well leave the industry and there by the price of the factor service will fall to the level of the maximum average revenue productivity. On the contrary, if the price is less than the average revenue productivity the firms well be enjoying extra profits. Attracted by these excess profits, new firms will enter the industry and compete for this factor service. This will tends to push the price upward to the level of average revenue productivity. There can be deviation from this equilibrium position in the short run but in the long run the price of a factor service must equal its marginal and average revenue productivity.

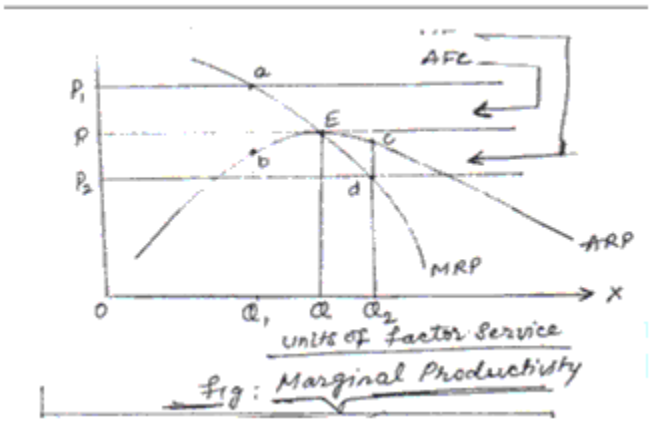


Fig: Marginal Productivity

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This is shown in fig. At point E, ARP=MRP each factor service will be paid OP price for OQ units. At OP_1 price, firm will be increasing ab/units los as the price being paid to factor unit is greater than their ARP. This will induce some firms to leave the industry and the factor price would again fall down to E. On the other hand if the factor price falls to OP_2 firms will gaining DC/unit when attracted by it some new firms enter the industry, price will again rise up to OP. These price variations are only possible in the short run, the equilibrium position E will stay on.

Assumption of the theory

1. All unit of a factor service are homogeneous.
2. They can be substituted for each other.
3. Perfect mobility of factors.
4. Perfect competition in the factor & commodity markets.
5. Full employment of factors & resources.
6. Different factor services are divisible.
7. Motivation of profit maximization.
8. Application in the long run.
9. It is based on the law of variable proportions.

Criticisms

1. All units of a factor are not homogeneous.
2. Factors are not perfectly mobile.
3. There is no perfect competition.
4. Factors are not fully employed.
5. All factors are not divisible.
6. Production is not the result of one factor alone.
7. Profit motive is not the main motive.

Glossary

1. **Abundance**--A physical or economic condition where the quantity available of a resource exceeds the quantity desired in the absence of a rationing system.
2. **Budget Set**--Different bundles of goods and services that are attainable to the consumer at given market prices and the consumer's fixed level of income.
3. **Competition**--The process of consumers bidding prices upwards or producers cutting prices in order to allow those agents to be involved in a market trade.
4. **Complementary Goods**---A pair of goods where the quantity demanded of one increases when the price of a related good decreases.
5. **Constant Returns to Scale (CRS)**--A long run production concept where a doubling of all factor inputs *exactly* doubles the amount of output.
6. **Consumer (household)**--An economic agent that desires to purchase goods and services with the goal of maximizing the satisfaction from consumption of those goods and services.
7. **Consumer Optimum**--Identification of an attainable bundle of goods that maximizes a consumer's level of satisfaction given his/her level of income and market prices.
8. **Consumer's Surplus**--The difference between what a consumer is willing to pay for each unit of a commodity consumed and the price actually paid.
9. **Cross-Price Elasticity of Demand**--A measure of sensitivity in the quantity demanded of one goods in reaction to changes in the price of a related good.
10. **Decreasing Returns to Scale (DRS)--**A long run production concept where a doubling of all factor inputs results in *less than* double the amount of output.
11. **Demand**--A relationship between market price and quantities of goods and services purchased in a given period of time. Represents the behavior of buyers in the market place.
12. **Diminishing Marginal Productivity (DMP)--**A short run production concept where increases in the variable factor of production lead to less and less additional output.
13. **Diminishing Marginal Utility (DMU)**--An economic concept that refers to the notion that additional units consumed of a particular commodity provide less and less additional satisfaction relative to previous units consumed.
14. **Economic Agent**--A decision maker involved in any type of economic activity.
15. **Economics**-- The study of how a given society allocates scarce resources to meet the unlimited wants and need of its members.

16. **Efficiency**--A situation in the allocation of resources where the benefits of consuming one more unit exactly equal the (social and private) costs or producing that good.
17. **Equilibrium**--A condition where there is no tendency for an economic variable to change.
18. **Expenditure**--The amount spent by a consumer on a bundle of goods or services (the product of market price and quantity demanded).
19. **Factors of Production**--An exhaustive list of inputs required for any type of production.
20. **Factor Prices**--The payments made to the factors of production (rents, wages, interest, and profits).
21. **Final Goods and Services**--Goods and services that are purchased for direct consumption.
22. **Fixed Costs of Production**--Those costs of production that are independent of production levels in the short run.
23. **Flow Variable** -- A variable that is measured per unit of time.
24. **Income Effect**--A reaction of consumer's demand for goods or services due to changes in purchasing power holding relative prices constant (see *Substitution Effect*).
25. **Income Elasticity of Demand**--A measure of sensitivity of quantity demanded to changes in consumer income.
26. **Income-Neutral Good**--A good where quantity demanded is unchanged when consumer income changes.
27. **Increasing Returns to Scale (IRS)**--A long run production concept where a doubling of all factor inputs *more than* doubles the amount of output.
28. **Indifference Curve**--A set of points that represent different bundles of goods which provide the consumer with the same level of satisfaction (or utility).
29. **Inferior Good**--A good where quantity demanded decreases when consumer income increases (there is an inverse relationship between quantity demanded and income).
30. **Intermediate Goods and Services**-- Goods (or services) used to produce other goods (i.e., capital equipment).
31. **Long Run Production**-- Production activity where all factors of production may vary in quantity. The firm has the freedom to substitute among these factors or production in attempts to minimize costs.
32. **Marginal Rate of Substitution**--The rate by which a consumer may substitute a quantity of one good for another holding his/her level of utility constant.

33. **Marginal Costs**--The cost of producing one more unit of a good in the short run. A measure of the opportunity costs of the variable inputs in their next best use.
34. **Marginal Revenue**--The revenue generated to a firm by selling one more unit of a good or service.
35. **Marginal Utility**--The satisfaction a consumer receives by consuming one more unit of some good or service.
36. **Market**--A place or institution where buyers and sellers come together and exchange factor inputs or final goods and services. A market is one particular type of economic rationing system.
37. **Monopolistic Competition**--A market structure similar to perfect competition in that there are a large number of firms competing in a given industry. However, each firm is selling a differentiated product and may exploit *brand preferences* such that is may act as a monopolist with respect to its own customers.
38. **Monopoly**--A market structure where only one firm exists in a given industry. This firm has a high degree of market power such that it is able to act as a *price-maker* with respect to market prices.
39. **Needs**--Goods and services essential for human survival.
40. **Normal Good**--A good where quantity demanded increases when consumer income increases (a direct relationship between quantity demanded and income).
41. **Oligopoly**--A market structure with only a few firms in a given industry.
42. **Opportunity Cost**--The value of a resource applied to its next best use.
43. **Perfect Competition**--A market structure where many firms exist, each with a small percentage of market share selling a homogeneous product. These firms are all *price-takers* with no influence on market price.
44. **Price Elastic Demand**--When the percentage change in quantity demanded exceeds the percentage change in market price.
45. **Price Elasticity of Demand**--A measure of sensitivity of quantity demanded to changes in market price.
46. **Price Inelastic Demand**--When the percentage change in quantity demanded is less than the percentage change in market price.
47. **Unitary-elastic Demand**--When the percentage change in quantity demanded is exactly equal to the percentage change in market price.
48. **Producer (business firm)**--An economic agent that converts inputs (factors of production) into output (goods and services) with the goal of maximizing profits from production and sale of those goods and services.
49. **Producer Optimum**--A choice of input combinations or output levels that maximize the profits of a producer taking all prices as a given.

50. **Producer's Surplus**--The difference between revenue received and the variable costs of production for each unit of a commodity sold. Represents a contribution to fixed costs and producer profits.
51. **Production Function**--A technical relationship between a certain level of factor inputs and the corresponding level of output.
52. **Production Possibilities Frontier**--A relationship between two types of output defining the tradeoff that exists in allocating resources from production of one good to the other.
53. **Profits**--The difference between sales revenue and the costs of production.
54. **Rationing Systems**--A process used to match the desire for goods and services with their availability.
55. **Relative Prices**--A ratio of any two prices or one particular price compared to a price index.
56. **Resources--**The raw materials and other factors of production that enter the production process or final goods and services that are desired by economic agents.
57. **Risk--** A measure of uncertainty about the value of an asset or the benefits of some economic activity.
58. **Satiation--**A level of consumption where the consumer is fully satisfied in a given period of time.
59. **Scarcity**--A physical or economic condition where the quantity desired of a good or service exceeds the availability of that good or service in the absence of a rationing system.
60. **Shortage**--A market condition where the quantity demanded of a particular good or service exceed the quantity available.
61. **Short Run Production**--Production activity where only one factor of production may vary in quantity. All other factors of production are fixed in quantity. Substitution among factors is not possible.
62. **Stock Variable**-- A variable measured at point in time.
63. Substitution Effect--The reaction of a consumer's demand for goods based on changes in relative prices holding purchasing power (or utility) constant (see *Income Effect*).
64. **Substitute Goods**--A pair of goods where the quantity demanded of one increases when the price of a related good also increases.
65. **Supply**--A relationship between market price and quantities of goods and services made available for sale in a given period of time.

66. **Surplus**-- A market condition where the quantity supplied of a particular commodity exceeds the quantity demanded
67. **Total Effect**--The observed change in quantity demanded due to a price change of one particular good.
68. **Unrelated Goods**--A pair of goods where the quantity demand of one is unaffected by changes in the price of the other.
69. **Utility**--A measure of the satisfaction received from some type of economic activity (i.e., consumption of goods and services or the sale of factor services).
70. **Variable Costs of Production**--Production costs related to changing quantities of a variable factor of production in the short run.
71. **Wants**--Preferences for goods and services over and above human needs.